Micro System FW12/20/21/21M/22/25

Service
Service
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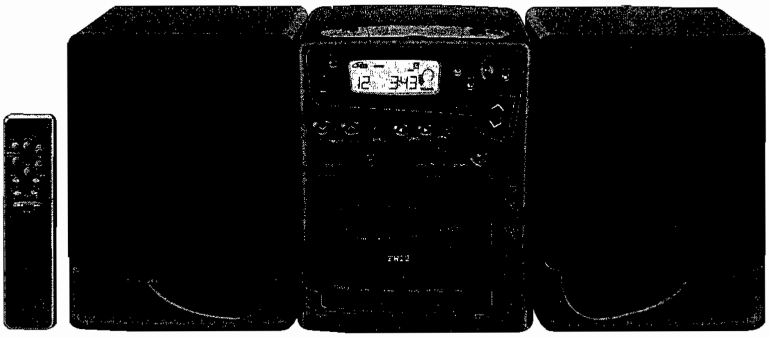

PHIL- 04942

Service Manual

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Service Manual RCD 1-2D

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PCS 83 060

PHILIPS

4.942

ECIFICATION

ENERAL

ains voltage		220 - 230V -/20/22 230 - 240V -/25
	Switchable	110 - 127V / 220-240V -/21/21M
ains frequency		50Hz - 60Hz
wer consumption		10W max.
mension (W x D x H)		170 x 212 x 241 mm

NER : FM SECTION

ning range		87.5MHz - 108MHz
frequency		10.7MHz
nsitivity at 26dB S/N		< 6.9µV
lectivity at 600kHz bandwidth		> 20dB
rejection		> 50dB
age rejection		> 20dB

NER : AM SECTION (/21/21M)

ning range	MW	522kHZ - 1611kHz
frequency		450kHz
nsitivity at 26dB S/N	MW	< 4.0mV/M
lectivity at 300kHz bandwidth	MW	> 16dB
rejection	MW	> 24dB
age rejection	MW	> 28dB

NER : AM SECTION

ning range	MW	522kHZ - 1611kHz
	LW	153kHz - 279kHz
frequency		450kHz
nsitivity at 26dB S/N	MW	< 4.0mV/M (3.0mV/M /22 only)
	LW	< 6.0mV/M
lectivity at 300kHz bandwidth	MW	> 16dB (24dB /22)
	LW	> 20dB (28dB /22)
rejection	MW	> 24dB (35dB /22)
	LW	> 26dB (40dB /22)
age rejection	MW	> 28dB (27dB /22)
	LW	> 30dB (40dB /22)

MPLIFIER

utput power at 10% distortion	Mains	2 x 5W -1dB
eaker impedance		2 x 6Ω
equency response within -3dB		63Hz -14kHz
adphone output at 32Ω		20mW

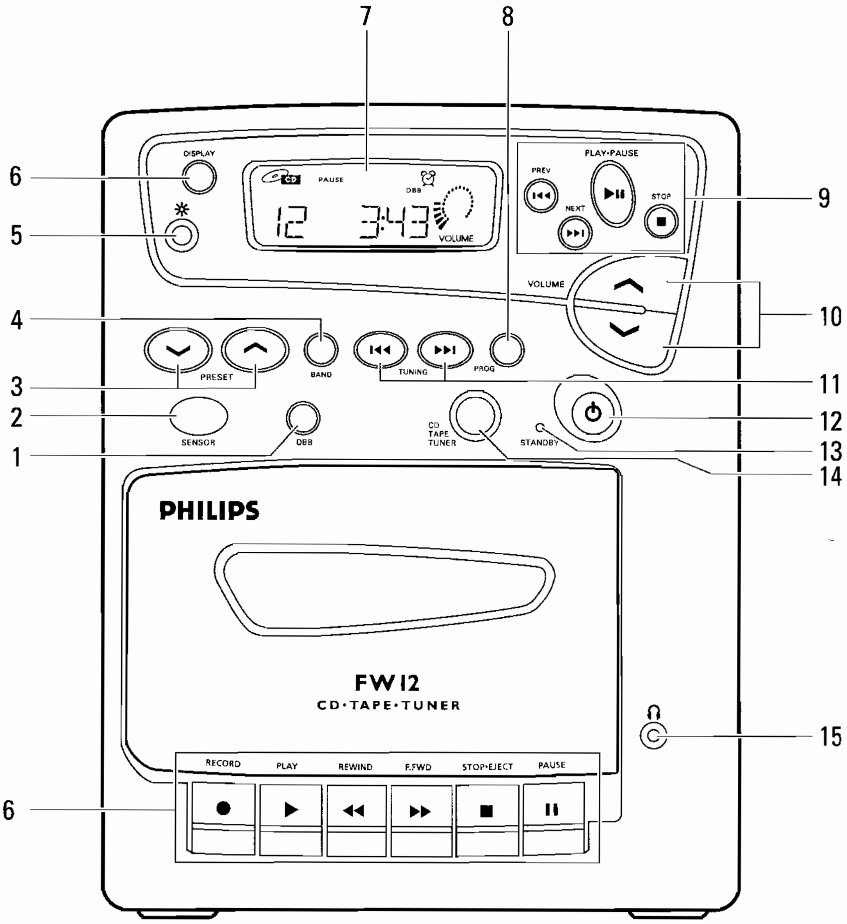
ASSETTE RECORDER

mber of tracks		2 x 2 stereo
pe speed		4.76 cm/sec ± 2%
ow and flutter		< 0.4%
st-wind time C60		<130 sec
as system		65kHz + 5kHz
cording playback frequency response within -8dB		250Hz - 6.3kHz
gnal to Noise ratio	IEC 1	> 42dB

OMPACT DISC

equency response within ± 3dB		20Hz - 20kHz
gnal/Hiss ratio		> 80dB
stortion at 1kHz		< 0.5%
annel difference at 1kHz		< 2dB
annel crosstalk at 1kHz		> 50dB

CONTROLS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8
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3
2
1
9
10
11
12
13
14
15
16
DISPLAY
PAUSE
DBB
12 3:43
VOLUME
PLAY•PAUSE
PREV
NEXT
STOP
VOLUME
PRESET
BAND
TUNING
PROG
SENSOR
DBB
CD TAPE TUNER
STANDBY
PHILIPS
FW12
CD•TAPE•TUNER
RECORD
PLAY
REWIND
F.FWD
STOP•EJECT
PAUSE

Front view

1 **DYNAMIC BASS BOOST (DBB)**
– To enhance the bass response

2 **REMOTE SENSOR**
– To receive signals from the remote control

3 **PRESET** ∧/∨
– To select a radio station in memory

4 **BAND**
– To select the desire waveband

5 **DIMMER (☼)**
– To select the desire LCD lighting background:- Off, Dim or Bright.

6 **DISPLAY**
– To view the status of the clock time, the current source or the countdown timer (if activated)

7 **LCD DISPLAY**

8 **PROGRAM**
– To program radio station in memory

9 **CD CONTROL PANEL**
PREV (⏮) – To skip to the beginning of the current or previous track or to search backward
NEXT (⏭) – To skip to the beginning of the next track or search forward
PLAY•PAUSE (▶ II) – To start or interrupt CD play
STOP (■) – To stop CD play

10 **VOLUME** ∧/∨
– To adjust the volume level

11 **TUNING ⏮ / ⏭**
– To tune to radio station

12 **STANDBY (⏻)**
– To switch the set ON or to standby mode.

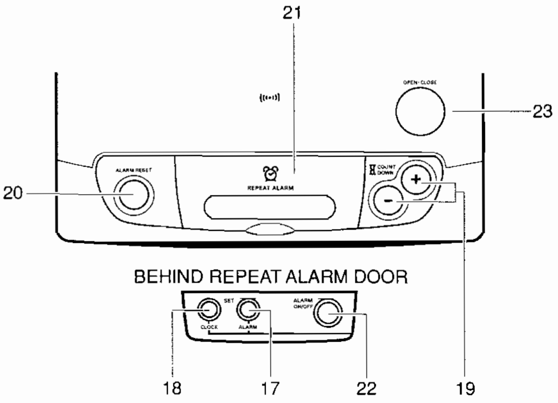
13 **STANDBY LIGHT**

14 **CD/TAPE/TUNER** select
– To select the following source :- CD, TAPE or TUNER.

15 **HEADPHONES** socket **(🎧)**
– To connect to the headphones (recommended 32 ohms)

16 **CASSETTE PLAYER CONTROL PANEL**
PAUSE (II) – To temporary stop play or recording
STOP•EJECT (■) – To stop or eject the cassette
F-FWD (▶▶) – To fast forward the cassette
REWIND (◀◀) – To fast rewind the cassette
PLAY (▶) – To start cassette play
RECORD (●) – To start cassette recording

CONTROLS


21
OPEN·CLOSE
23
ALARM RESET
20
REPEAT ALARM
COUNT DOWN
+
–
BEHIND REPEAT ALARM DOOR
SET
CLOCK
ALARM
ALARM ON/OFF
18
17
22
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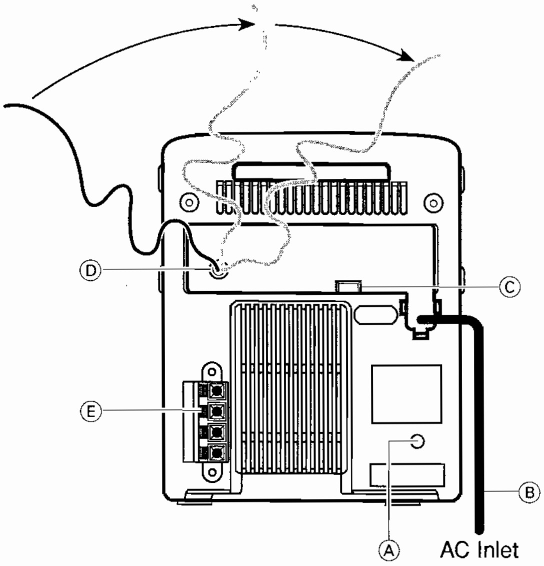


Top View

17 ALARM SET
- To set the alarm

18 CLOCK SET
- To set the clock

19 COUNTDOWN TIMER +/–
- To set countdown timer, clock or alarm

20 RESET ALARM
- To reset the alarm

21 REPEAT ALARM
- To repeat the alarm

22 ALARM ON/OFF
- To switch on or off the alarm

23 CD DOOR
- To load a CD

Back View

Ⓐ **VOLTAGE SELECTOR** (Not for all versions)
- If your system has a voltage selector, set it to the local mains voltage.

Ⓑ **MAINS CORD**
- Cable for the mains supply.

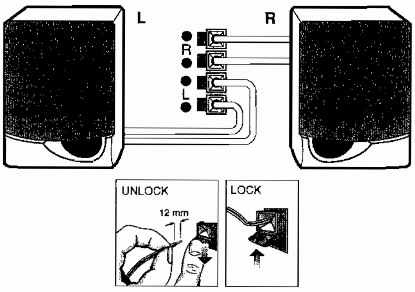
Ⓒ **AM LOOP AERIAL** socket
- For connection to AM antenna.
- For optimum AM reception, adjust the position of the loop antenna.

Ⓓ **FM AERIAL** socket
- For connection to FM antenna.
- For optimum FM reception, adjust the position of the FM aerial wire.

Ⓔ **SPEAKERS**
- Terminals for two loudspeakers (impedance 6Ω)

CONNECTIONS

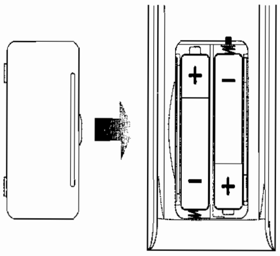
Speakers



- The red wire should be connected to the red terminal and the black one to the black terminal.
- Make sure that the colour combination of wire and terminal is the same for each loudspeaker.
- Clip the bare portion of the wire as shown above.

Batteries

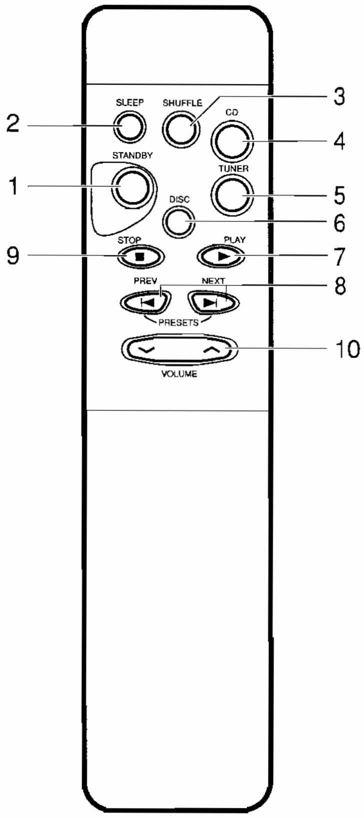
- Open the battery compartment of the Remote Control and insert the supplied batteries.
- Remove the batteries when they have run down or if they will not be used again for a long period. For replacement use only batteries of the type R03, UM-4 or AAA.



Note: Do not dispose of exhausted batteries with your household waste. Please inquire about how to dispose of batteries according to local regulations.

REMOTE CONTROL

Remote control functions

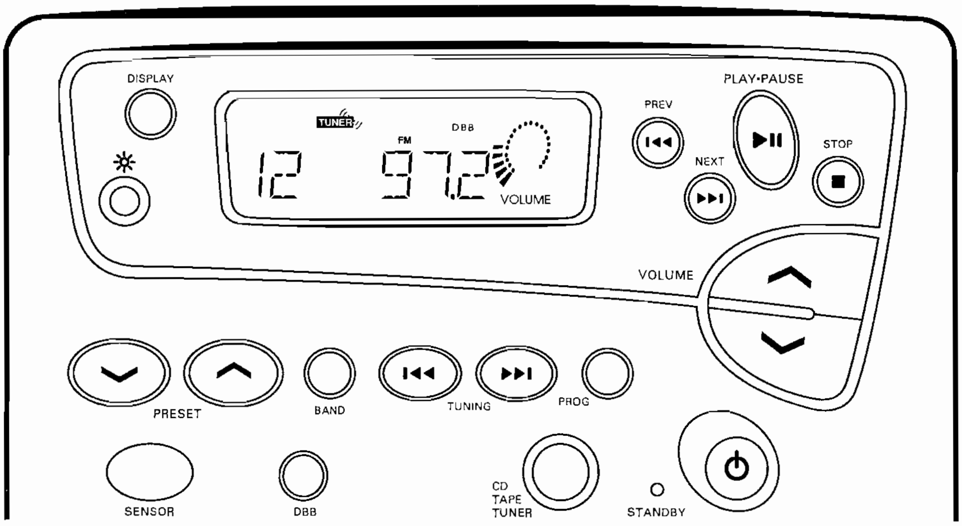


Note :

1. You must first select the respective source button. (e.g. CD or TUNER)
2. Then select the desired function.

1 STANDBY – to switch to standby mode
2 SLEEP – to select time to standby mode
3 SHUFFLE – to play the CDs in a random order.
4 CD – to select CD mode.
5 TUNER – to select TUNER mode
6 DISC – Not functional
7 PLAY – to play or pause CD.
8 For CD
PREV ⏮ / NEXT ⏭ – to select another track during play.
For TUNER
PRESET ⏮ / ⏭ – for selecting preset stations.
9 STOP
10 VOLUME ∧ / ∨ – to adjust the volume level.

TUNER



Tuning

1. Select **TUNER** with **CD/TAPE/TUNER** select button.
2. Press **BAND** to select desired waveband.
3. Press **TUNING** ⏮ or ⏭ for a second.
   → The frequency display will change until a station with sufficient strength is found.

- Repeat this procedure until the desired station is reached.
- In order to tune to a weak station, briefly press **TUNING** ⏮ or ⏭ until the display shows the right frequency and/or optimum reception has been obtained.

Preset Programming

1. Tune to the station to be programmed as described under "Tuning".
   → The preset number will appear if the desired station is already been programmed.
2. Press **PROGRAM.**
   → PROGRAM blinks on the display.
3. Choose a preset number for the preset station with **PRESET** ⌃ / ⌄.
4. Press **PROGRAM.** The station will now be stored in the memory.
   → PROGRAM disappears from the display.

- Repeat the above procedure if you wish to store other frequencies in the memory.
  Up to 20 preferred stations can be stored in the memory of the tuner.

Selecting Preset station

1. Use the **PRESET** ⌃ / ⌄. (**PRESET** ⏮ / ⏭ on the remote control) to select the preset station.

   When you select to a preset station, the preset number appears on the display next to the frequency.

Tuning grid (not for all versions)

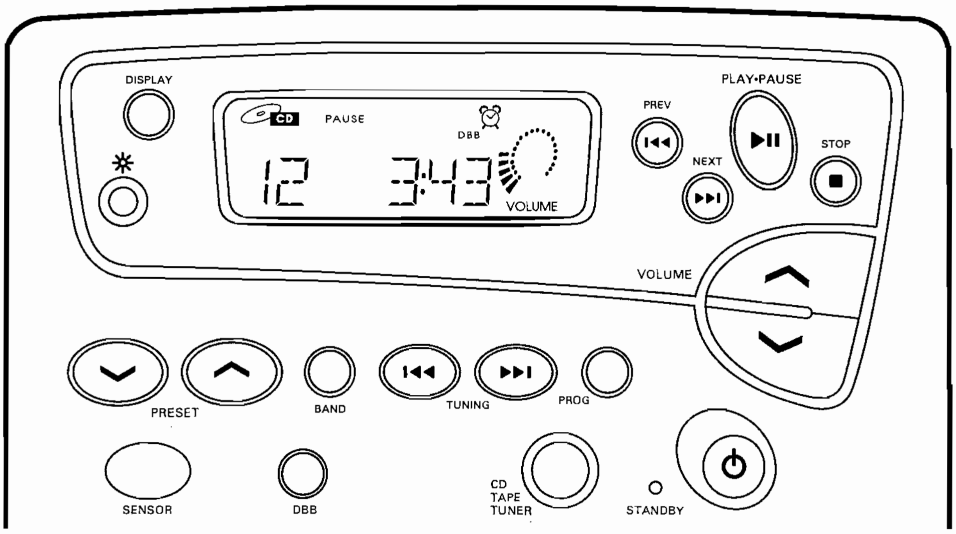
Changing to 10kHz or 9kHz

In North and South America the frequency step between adjacent channels in the AM band has to be 10kHz. In all other parts of the world this step is 9kHz. In some versions of this unit the frequency step can be changed. To change to 10kHz, proceed as follows:

1. Switch off the power supply.
2. Keep **BAND** and **TUNING** ⏭ both pressed and switch on the power supply.
   → The display will show MW 10 for 2 seconds.

- To change back to 9kHz, repeat this procedure with **BAND** and **TUNING** ⏮.
  → The display will show MW 9 for 2 seconds.

COMPACT DISC PLAYER



Playing a Disc

The CD player can play normal CDs with a diameter of 5" (12 cm) and also small CDs with a diameter of 3" (8 cm) (CD singles). An adaptor ring for 3" (8 cm) CDs is not required.

1 Select **CD** with **CD/TAPE/TUNER** select button.

2 Press open the CD cover and place the CD onto the disc tray with printed side up.

3 Close the CD cover.

4 Start play by pressing **PLAY•PAUSE ▶ II**.
→ The track number and the elapse playing time of the track will now appear on the display.

- To interrupt play, briefly press **PLAY•PAUSE ▶ II**.
  → PAUSE will then appear on the display.
  To resume play, press **PLAY•PAUSE ▶ II** again.
- To stop play, press **STOP ■**.

  The CD player will also return to the stop position if:
  – another source is selected.
  – the end of the last track has been reached.

Searching for a particular passage during CD play

- Hold down **PREV I◀◀** or **NEXT ▶▶I** until the desired passage is located. During the search the sound is played faster than normal at a reduced volume. Play returns to normal when **PREV I◀◀** or **NEXT ▶▶I** is released.

Selecting a particular track during play

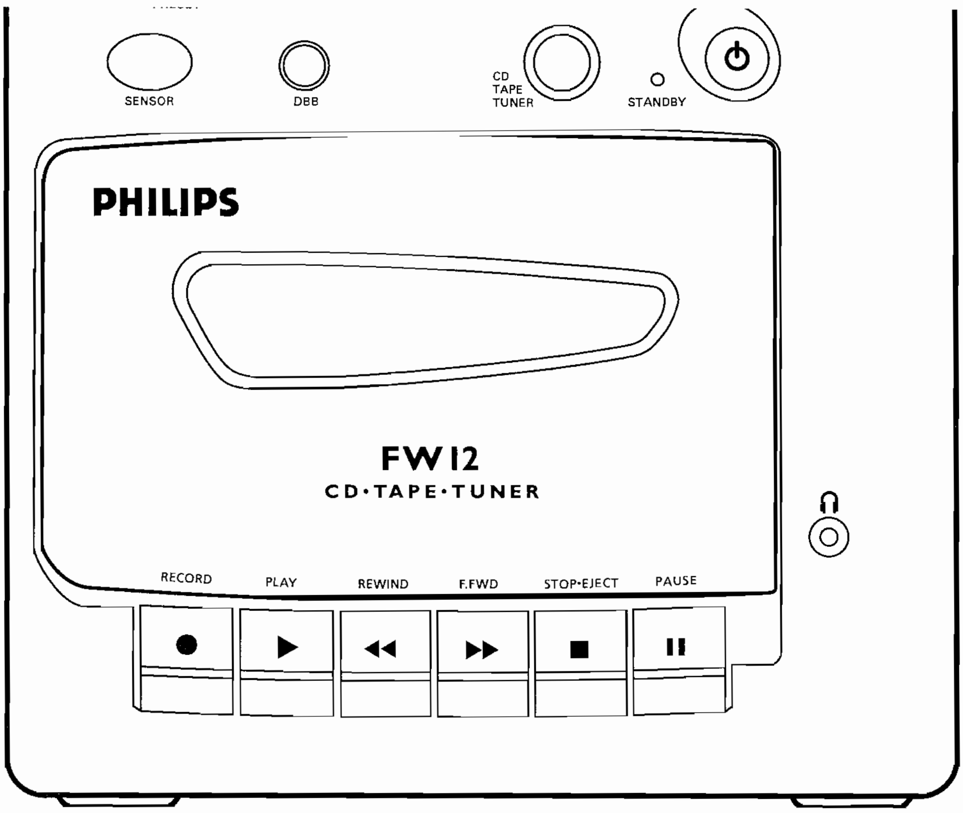
- Press **PREV I◀◀** or **NEXT ▶▶I** briefly until the desired track appears on the display.

Shuffle (only on RC)

- Press **SHUFFLE**.
  → SHUFFLE, and track selected at random will appear on the display.

  The CD will now be played in random order, until you press **STOP ■**.
- Press **SHUFFLE** to resume normal play.

CASSETTE DECK



Playback

Any type of cassette can be used.

1 Select **TAPE** with the **CD/TAPE/TUNER** select button.

2 Open cassette compartment by pressing **STOP•EJECT ■** and insert a cassette with the open side downwards and the full spool to the left.

3 Press **PLAY ▶**.

- To interrupt playback briefly, press **PAUSE II**. To resume playback, press **PAUSE II** again.
- End playback by pressing **STOP•EJECT ■**.

Fast winding or rewinding

- By pressing **F.FWD ▸▸** or **◂◂ REWIND**, fast winding or rewinding of the tape is possible in respective direction.
- To stop fast winding or rewinding, press **STOP•EJECT ■**.

Recording

Copyright: Recording is permitted only in so far as copyrights or other rights of third parties are not thereby infringed.

To ensure optimum sound quality, we recommend the use of FERRO cassettes (IEC type I) only.

1 Select the desired sound source to be recorded with the **CD/TAPE/TUNER** select.

2 Insert a cassette with the open side downwards and the full spool on the left.

3 Press **PAUSE II**.

4 Press **RECORD ●**.

5 Start recording by pressing the **PAUSE II** again.

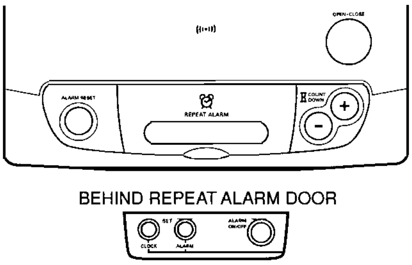
- To interrupt recording briefly, press **PAUSE II**. To resume recording, press **PAUSE II** again.
- Press **STOP•EJECT ■** to end recording.

Note: Do not use protected cassette (i.e. cassette with the tabs removed), as the RECORD key will not function.

Automatic switch-off

If the end of the tape is reached during recording, playback or fast winding, the tape will stop and the respective key will automatically be switched off.

CLOCK/TIMER



Setting the Clock

1 Press **CLOCK SET**.
→ The display will shows current set time.

2 Press **COUNTDOWN TIMER +** or — to set the time.
- You can hold down the **COUNTDOWN TIMER +** or — button to scroll through the time faster.

3 Press **CLOCK SET** again to complete clock setting.

Note : If no action is performed during the clock setting mode, after 90 seconds the time set function will be disabled and the clock will not be set.

Setting the Alarm

- Before setting the alarm, make sure the clock is set correctly.

1 Press **ALARM SET**.
→ The display will shows current selected source.

2 Press **COUNTDOWN TIMER +** or — to select TUNER, CD or BUZZER.

3a To select Tuner
- Select TUNER and press **ALARM SET** to confirm selection.
- Press **COUNTDOWN TIMER +** or — to select your preferred preset station.
→ The selected preset station and frequency appear on the display.
- Press **ALARM SET** to confirm the selected station.
→ The display shows the last selected wake up time.

3b To select CD
- Select CD and press **ALARM SET** to confirm selection.
- Press **COUNTDOWN TIMER +** or — to select your preferred track.
→ The selected track appears on the display.
- Press **ALARM SET** to confirm the selected track.
→ The display shows the last selected wake up time.

3c To select Buzzer
- Select BUZZER and press **ALARM SET** to confirm selection.
→ The display shows the last selected wake up time.

4 Press **COUNTDOWN TIMER +** or — to select your desired wakeup time.
- You can hold down the **COUNTDOWN TIMER +** or — button to scroll through the time faster.

5 Press **ALARM SET** to store selection.
→ The wakeup timer is switched on, it will display all your alarm setting and the (⏰) appears.

Note : The buzzer or the wakeup source will stop automatically after one hour if no other function is performed.

Repeat Alarm

A. The set on standby mode and CD, Tuner or Buzzer as alarm
- Press **REPEAT ALARM** or any remote control button when alarm (CD, Tuner or Buzzer) is sounding.
  → You will hear a short beep sound and the display will shows SNOOZE every 10 seconds.
  → The alarm (CD, Tuner or Buzzer) will stop and the set is on standby mode. It will sounds again after 10 minutes.

B. The set on CD, Tuner or Tape mode and Buzzer as alarm
- Press **REPEAT ALARM** or any remote control button when alarm (Buzzer) is sounding.
  → You will hear a short beep sound and the display will shows SNOOZE every 10 seconds.
  → The Buzzer will stop and the set will continue in the respective CD or Tuner mode. The alarm will sounds again after 10 minutes.

C. The set on CD or Tuner mode and CD or Tuner as alarm
→ When the alarm time activates, it will switch to the respective alarm mode. Repeat alarm is not available on this setting.

To cancel Repeat Alarm
- Press any remote control key or set buttons except the REPEAT ALARM.
  → You will hear a long beep sound.

Alarm Reset

This feature enables you to repeat the alarm everyday at the set time.

- Press **ALARM RESET** when alarm is sounding.
  → The alarm will sound again on the next day at the same time.

Switching On/Off the Alarm

- Press **ALARM ON/OFF** once.
  → The wakeup timer is switched off and the alarm (⏰) disappear.
- Press **ALARM ON/OFF** again.
  → The wakeup timer is switched on, it will display all your alarm setting and the (⏰) reappears.

CLOCK/TIMER/OTHER FEATURES

Countdown Timer

This feature enables you to do a sixty minute countdown. At the end of the countdown time, you can hear a buzzer sound.

- Press **COUNTDOWN TIMER +** or **—** to select the desire countdown time.
  → You can hold down the **COUNTDOWN TIMER +** or **—** button to scroll through the time faster
  → The countdown timer will start to countdown in second when the button is released.

To switch off the countdown timer

- Press **COUNTDOWN TIMER +** or **—** until display shows **OFF**.

Sleep Timer (only on RC)

This feature enables you to select a time after which the set will switch to the standby mode automatically. The timer can be set in 60, 30, 10 minutes mode.

- Press **SLEEP** on the remote control to select the desire sleep time.
  → At the end of the sleep time, the set will switch over to the standby mode.

To switch off the sleep timer; press the **SLEEP** button on the remote control until display shows **OFF**.

Demonstration mode

This feature enables you to have a preview of all the available functions in the set.

- Press **DISPLAY** for more than 3 seconds.
  → Demonstration begins.
- To stop demonstration mode, press the **DISPLAY** button again for 3 seconds.

Note : The demonstration mode works only if the set is in the standby mode and the countdown timer is not active. Also if the alarm mode is on, the demonstration mode will be stopped temporary when the alarm sounds. It will resumed again once the alarm sound is switched off.

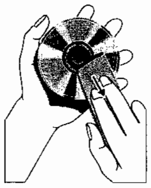
Dimmer (☼)

This feature enables you to control the back lighting of the LCD display panel.

- Press **DIMMER** to select either bright, dim or off.

GENERAL

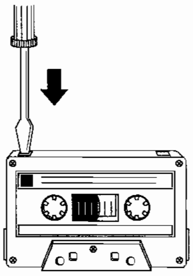
CD and CD player maintenance



- Never write on a CD or attach any stickers to it.
- Keep the shiny surface of the CD clean. For cleaning, use a lint-free cloth and always wipe the disc in a straight line from the centre to the edge.
- Never use cleaning agents intended for conventional records.
- Never use detergents or abrasive cleaning agents.
- For cleaning the CD player use a slight damp leather cloth.
- Do not expose the unit to direct sunlight for any length of time and do not expose it to excessive heat (e.g. close to heating equipment).
- Do not expose the unit to dampness or rain.

Cassettes and Cassette deck maintenance

The tape in the cassette is secured at both ends with leader tape. You should bear in mind, therefore, that at the beginning and at the end of the cassette nothing will be recorded for 6 to 7 seconds!

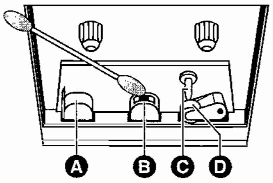


- When a new recording is made, the old one will automatically be erased. However, the accidental erasure of a recording can be prevented by breaking the small plastic protection on the top left-hand corner on the back of the cassette.

This protection against erasure or recording can be reversed by sticking a small piece of adhesive tape over the slot that has been made.

- After use, store your cassettes in the box provided. Do not place them in the sunlight, close to magnets, transformers of TV sets or loudspeakers.

After approximately 50 hours of use, the heads Ⓐ and Ⓑ, the capstan Ⓒ and the pressure roller Ⓓ must be cleaned. If this is not done, both recording and playback quality may be impaired.



- You can clean these parts by playing an SBC 114 cleaning cassette or by using a cotton bud dipped in alcohol. When cleaning, make sure that the unit is not connected to the mains.

- The drive mechanism must **not** be lubricated!

TROUBLESHOOTING GUIDE

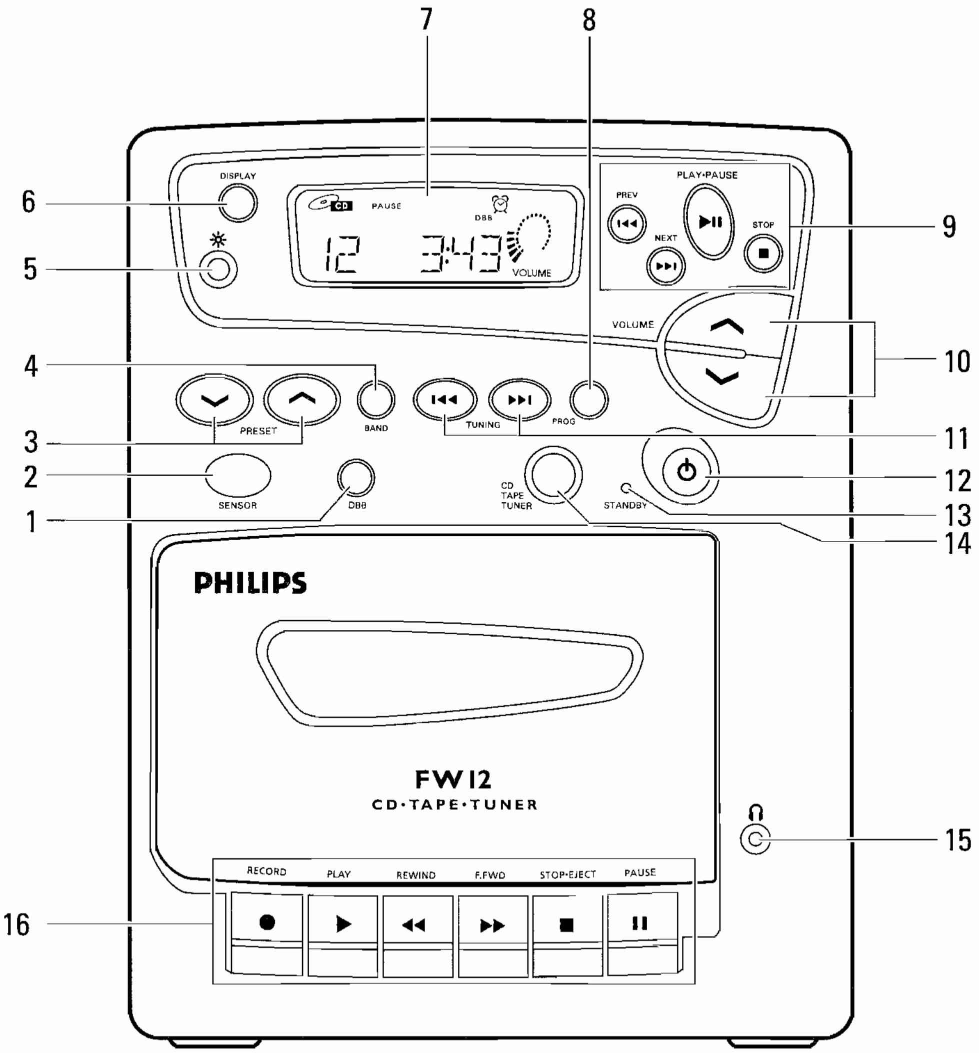
The following checks will assist in the correction of most problems which you may encounter with your system. Before going through the check list below, first check the following points.

☞ ***The power cord must be connected firmly.***

☞ ***The speaker connection must also be firm.***

Should any problem persist after you have made these checks, consult your nearest dealer.

Symptom	Cause (and Remedy)
Radio Reception	
Interference noise during FM stereo reception	The signal strength is too weak. (Adjust the FM aerial wire's position.)
Cassette Deck Operation	
Recording is not possible	No cassette in the cassette compartment. The small tab has been broken (This can be reversed with a piece of adhesive tape). The tape is completely wound.
Not possible to insert or remove the cassette from the deck.	Check that all the cassette deck buttons are released. (If not, press **STOP•EJECT**.) (– See General section on cassette deck maintenance.)
Recording or playback cannot be made or there is a decrease in sound level.	Dirty tape head Magnetic build-up in the record/playback head
Excessive wow or flutter, or sound drop-out.	Contamination of the capstans or pinch rollers. (– See General section on cassette deck maintenance.)
CD Player Operation	
The **PLAY•PAUSE** does not function when pressed	The disc is not inserted correctly. The disc is inserted upside down. The CD is dirty, badly scratched or warped. (Try another disc.)
Track in the CD skips	The CD is dirty, badly scratched or warped. (Try another disc.)
General	
Set not working	Hang up problem due to Electro-static discharge. Switch **POWER** off and on again or in the worst case, pull the mains plug out of the wall socket and then reconnect the unit. Check that the power cord is connected firmly.
No sound output	(Adjust **VOLUME** to higher level or switch **POWER** off and on again.)
No sound from one speaker or unbalanced left and right sound	(Check the speaker connections and speaker position.)
Severe hum or noise	The TV or VCR is too close to the stereo system. (Separate the set from the TV or VCR.)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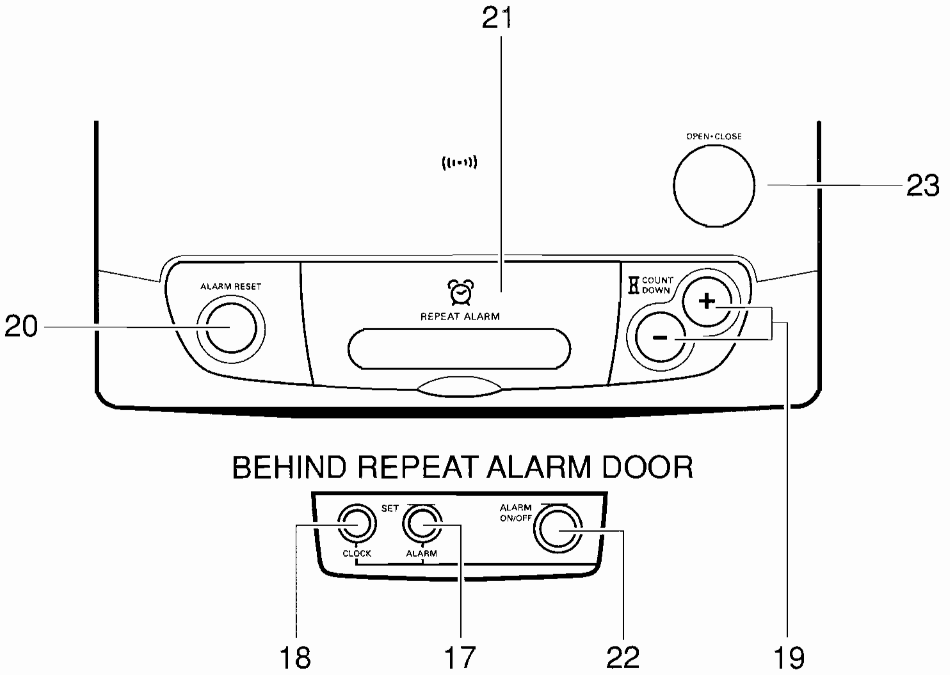
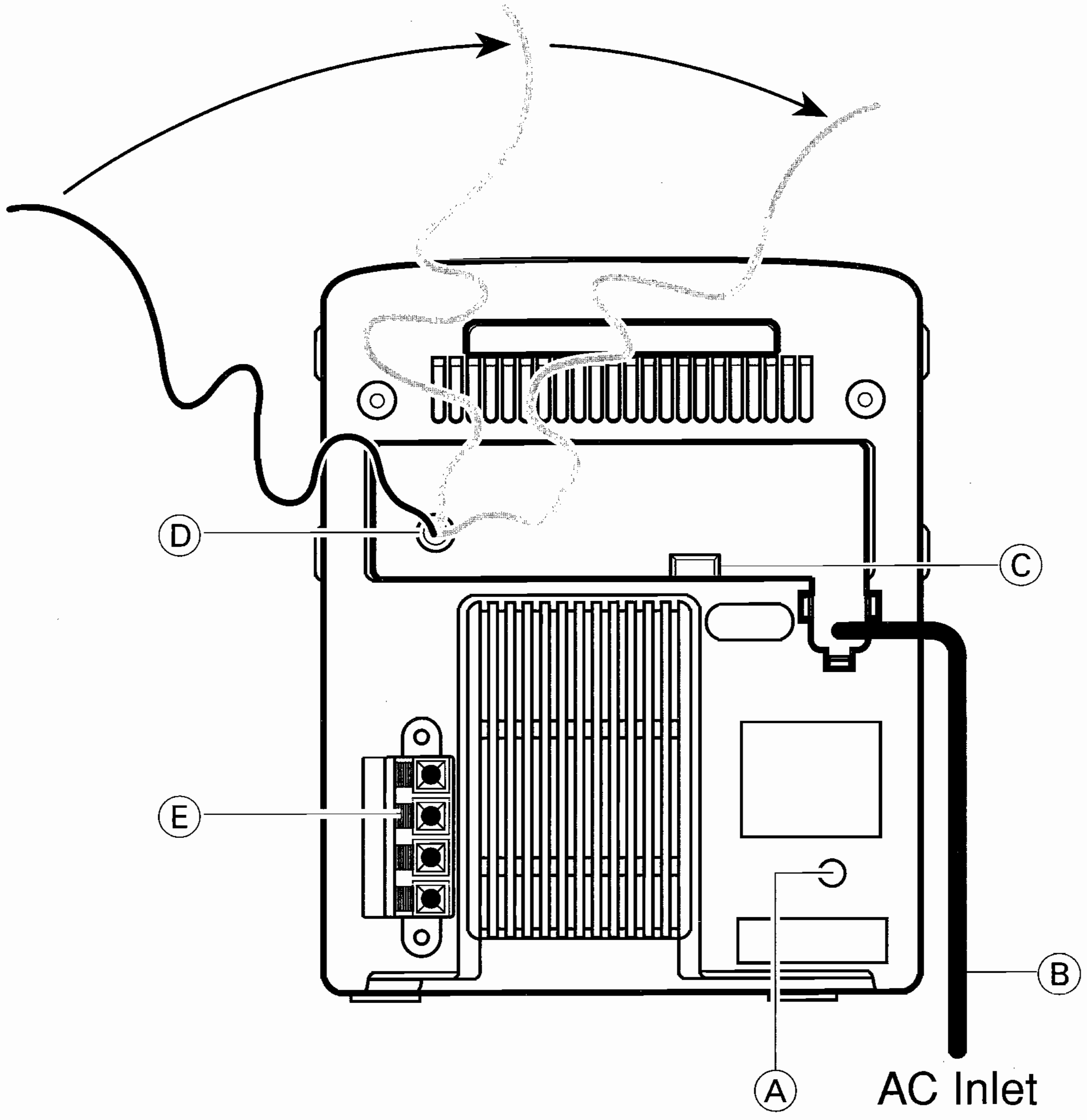
DISPLAY
CD
PAUSE
DBB
12
3:43
VOLUME
PLAY•PAUSE
PREV
NEXT
STOP
VOLUME
PRESET
BAND
TUNING
PROG
SENSOR
DBB
CD
TAPE
TUNER
STANDBY
PHILIPS
FW12
CD•TAPE•TUNER
RECORD
PLAY
REWIND
F.FWD
STOP•EJECT
PAUSE


21
OPEN•CLOSE
23
ALARM RESET
20
REPEAT ALARM
COUNT
DOWN
+
–
BEHIND REPEAT ALARM DOOR
SET
ALARM
ON/OFF
CLOCK
ALARM
18
17
22
19

CONNECTION AND CONTROL



Connections and Controls

1	DBB Button	1487
2	Remote Control sensor	6411
3	Preset up/down	1481/1482
4	Band Selector	1480
5	Dimmer button	1488
6	Display button	1489
7	LCD display	1400
8	Program button	1477
9	CD function	1473-1476
10	Volume up/down	1483/1484
11	Tuning up/down	1478/1479
12	Power on/off	1486
13	Standby led	6401
14	Source selector	1485
15	Headphone	1251
16	Cassette keyboards	
17	Alarm set	1466
18	Timer set	1465
19	Set -/+	1460/1463
20	Alarm reset	1462
21	Repeat alarm	1461
22	Alarm on/off	1464
23	CD open/close	
A	Voltage selector	1307
B	Mains cord	385
C	AM aerial	352
D	FM aerial	351
E	Speaker socket	1221

Service Aids

Screw drivers:	
Universal tool holder	4822 395 91019
Torx driver set T6 - T20	4822 395 50145
Torx driver T8	4822 395 50263
Torx driver T10 extented	4822 395 50423
Torx bit T10 150mm	4822 395 50456
Cassettes:	
SBC420 Test cassette Ferro - IEC I	4822 397 30071
Compact disc:	
SBC429 Audio Signals disc	4822 397 30184

SERVICE TEST PROGRAM

Operating sequence	Display shows	Remarks	In case of problems check
Hold "Program" and "Preset Up" button down while Power on to enter Service test program.	XX YY-S	XX - Type no. numeric YY - Master microp version S - Service mode	
Press "Preset Down"	32K	The Alarm buzzer is turned on. An output signal of 4096 Hz is available at pin 4 of the microprocessor.	Check X'tal 5402.
Press "Preset Down"	8M	The output signal at pin 4 is now 3906.25 Hz.	Check 8MHz oscillator 5401.
Press "Preset Down"	Main menu appear.		
Press "Tuning Up"	FAST Main menu reappears after 2 seconds.	Fast clock test.	
Press "Tuning Up"	NOM Main menu reappears after 2 seconds.		
Press "Program"	PASS Main menu reappears after 2 seconds.	Eeprom test.	Check IC 7401 if display shows ERR OR E
Press "Band"	NEW Main menu reappears after 2 seconds.	Eeprom format.	
Press "Display"	See figure 1 - 4 and Main menu.	Pressing the "Preset down" key will scroll through the 4 different displays and the Main menu.	
Press "Tuning Down"	TAPE CD TUNER Main menu reappears after 2 seconds.	During source switching the set is not muted.	
Press "Dimmer" and followed by any key on the set or remote control. Press "Dimmer" to return to Main menu.	See key test Table 1 and 2.		

Operating sequence	Display shows	Remarks	In case of problems check
To perform CD test press "Play /Pause" at the Main menu screen.	CD VXX	The CD servo version is display. XX = version number	Pressing the "Stop" key to go back to Pos. 0 Pressing "Stop" again to exit the CD service mode.
Press "Stop" - Service pos 0		The slide servo moves inside.	
Press "Next"		The slide servo moves outside.	
Press "Up" = "+"		The disc motor turns in the clockwise direction.	
Press "Down" = "-"		The disc motor turns in the anti-clockwise direction.	
Press "Play/Pause" - Service pos 1	FOC 1	Focus is switch on.	Press "Stop" to turns off the laser and returns to service Pos. 0.
Press "Play/Pause" - Service pos 2	RDL 2	The disc motor is on but the radial servo is not on.	Press "Stop" to turns off the laser and returns to service Pos. 0.
Press "Play/Pause" - Service pos 3	DISC 3	The radial servo is on and the mute is released. (Music can be heard if there is a disc.)	
Pressing "Previous" or "Next".		The focus lens will jump on small steps inside or out.	
Pressing "Up" or"Down"		The focus lens will moves fast in or out respectively.	Press "Stop" to turns off the radial servo, the motor, the laser and the focus and returns to service Pos. 0.
To end the Service test program press "Stop" to return to the main menu, then press "Stop" again to exit.			
To perform Tuner test ensure no disc is in the CD tray and press "Preset Up" at the main menu.	CCC	Tuner version is scrolled in the display. CCC - Tuner version (refer to Table 4.)	
Use the "Preset Up" and "Preset down" to display the loaded frequencies.	See Table 4.	Service frequencies are now loaded into the EEPROM of the microprocessor.	
To end the Service test program disrupt the Mains supply.			

Note : XX - Model no. (eg. 12 for FW12, etc.)

YY - Software version, counting down from 99

TABLE 1. SERVICE KEY TEST TABLE

Function Keys	Display	Function Keys	Display	Function Keys	Display
Set Alarm	01	Volume Up	10	CD Play/Pause	18
Source Select	03	Volume Down	11	Tuner Prog	19
Standby On	04	Preset Up	12	Tuning Up	20
DBB	05	Preset Down	13	Tuning Down	21
Dimmer	06	Band	14	Up	22
Display	07	Alarm on/off	15	Down	23
Clock set	08	Alarm repeat	16	Next/Search fwd	24
Alarm reset	09	CD Stop	17	Previous/Search background	25

TABLE 2. SERVICE REMOTE CONTROL KEY TEST TABLE

Function Keys	Display	Function Keys	Display	Function Keys	Display
Volume Up	10	Next	24	Shuffle	33
Volume Down	11	Previous	25	Sleep	36
Preset Up	12	Standby	29	CD Play/Pause	37
Preset Down	13	CD	30		
CD Stop	17	Tuner	31		

LCD SERVICE DISPLAY

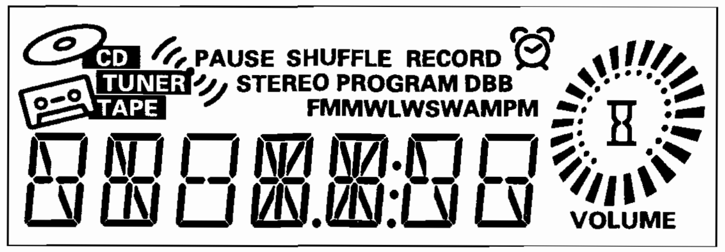

CD
TUNER
TAPE
PAUSE SHUFFLE RECORD
STEREO PROGRAM DBB
FMMWLWSWAMPM
VOLUME

Figure 1

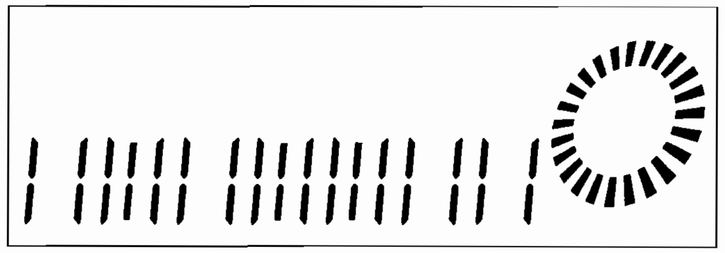


Figure 2

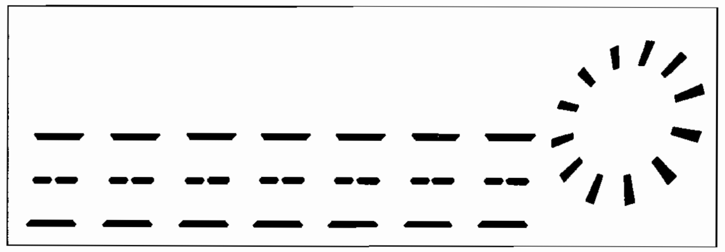


Figure 3

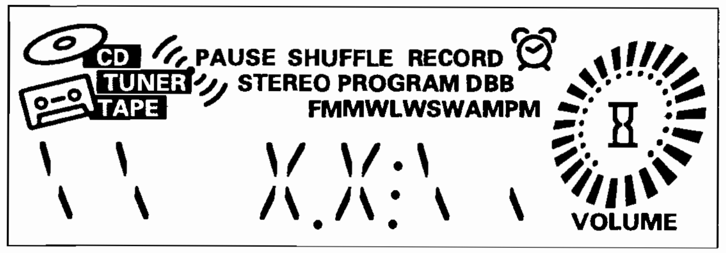

CD
TUNER
TAPE
PAUSE SHUFFLE RECORD
STEREO PROGRAM DBB
FMMWLWSWAMPM
VOLUME

Figure 4

TABLE 4. TUNER SERVICE TEST FREQUENCIES

PRESET	Europe "EUR"	Europe SW "EUS"	EastEur "EAS"	Overses "OSE"	Oversea SW "OSS"	USA "USA"	Japan "JAP"	Japan "JAT"
1	108.00 MHz	108.00 MHz	108.00 MHz	108.00 MHz	108.00 MHz	108.00 MHz	90.00 MHz	90.00 MHz
2	87.50 MHz	87.50 MHz	65.81 MHz	87.50 MHz	87.50 MHz	87.50 MHz	76.00 MHz	76.00 MHz
3	1611 kHz	1611 kHz	1611 kHz	1584/ 1710 kHz	1584/ 1710 kHz	1710 kHz	1629 kHz	1629 kHz
4	522 kHz	522 kHz	522 kHz	522/ 530 kHz	522/ 530 kHz	530 kHz	522 kHz	522 kHz
5	279kHz /--	279kHz /--	279 kHz		12.1 MHz		--	CH 1 (95.75MHz)
6	153kHz /--	153 kHz /--	153 kHz		3.9 MHz	--	--	CH 3 (107.75 MHz)
7	98.00 MHz	98.00 MHz	98.00 MHz	98.00 MHz	98.00 MHz	98.00 MHz	80 MHz	80 MHz
8	558 kHz	558 kHz	558 kHz	549/ 560 kHz	549/ 560 kHz	560 kHz	558 kHz	558 kHz
9	1494 kHz	1494 kHz	1494 kHz	1395/ 1500 kHz	1395/ 1500 kHz	1500 kHx	1494 kHz	1494 kHz
10	549 kHz	549 kHz	549 kHz	540/ 550 kHz	540/ 550 kHz	550 kHz	549 kHz	549 kHz
11		18.1 MHz			4.25 MHz			
12		5.9 MHz			8.00 MHz			
13		6.2 MHz			11.9 MHz			
14		17 MHz						
15		12 MHz						

TABLE 3. CD ERROR CODES TABLE

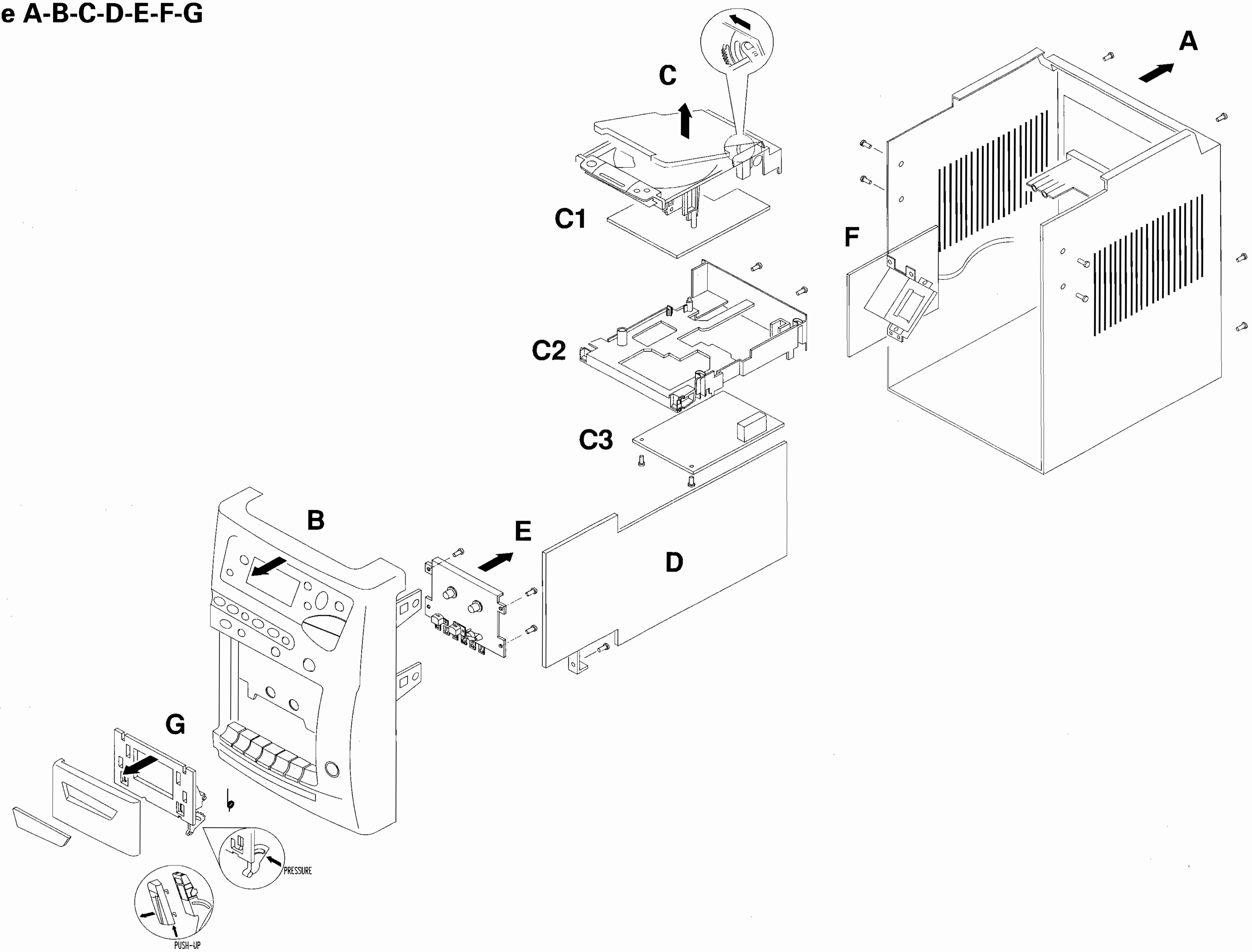
Error codes	Remarks
ERR 1002	Focus error, no disc
ERR 1007	Subcode error, no valid subcode
ERR 1008	TOC error, out of lead-in area while reading TOC
ERR 1009	CD decoder error
ERR 1010	Radial error
ERR 1012	Fatal sledge error
ERR 1013	Turntable motor error
ERR 1030	Too many grooves to jump
ERR 1031	Search timeout
ERR 1032	Search binary error
ERR 1033	Search index error
ERR 1034	Search time error
ERR 1037	Selection error

ADJUSTMENT	CASSETTE	SK ...	TAPEDECK POSITION	MEASURE ON	READ ON	ADJUST WITH	ADJUST TO
Azimuth	10 KHz SBC 420*	Cass.	Play	1251	mV-meter	Left hand screw of R/P head	Maximum
Motor Speed	3150 Hz SBC 420*	Cass.	Play	1251	Wow and Flutter meter	Preset in motor	** a

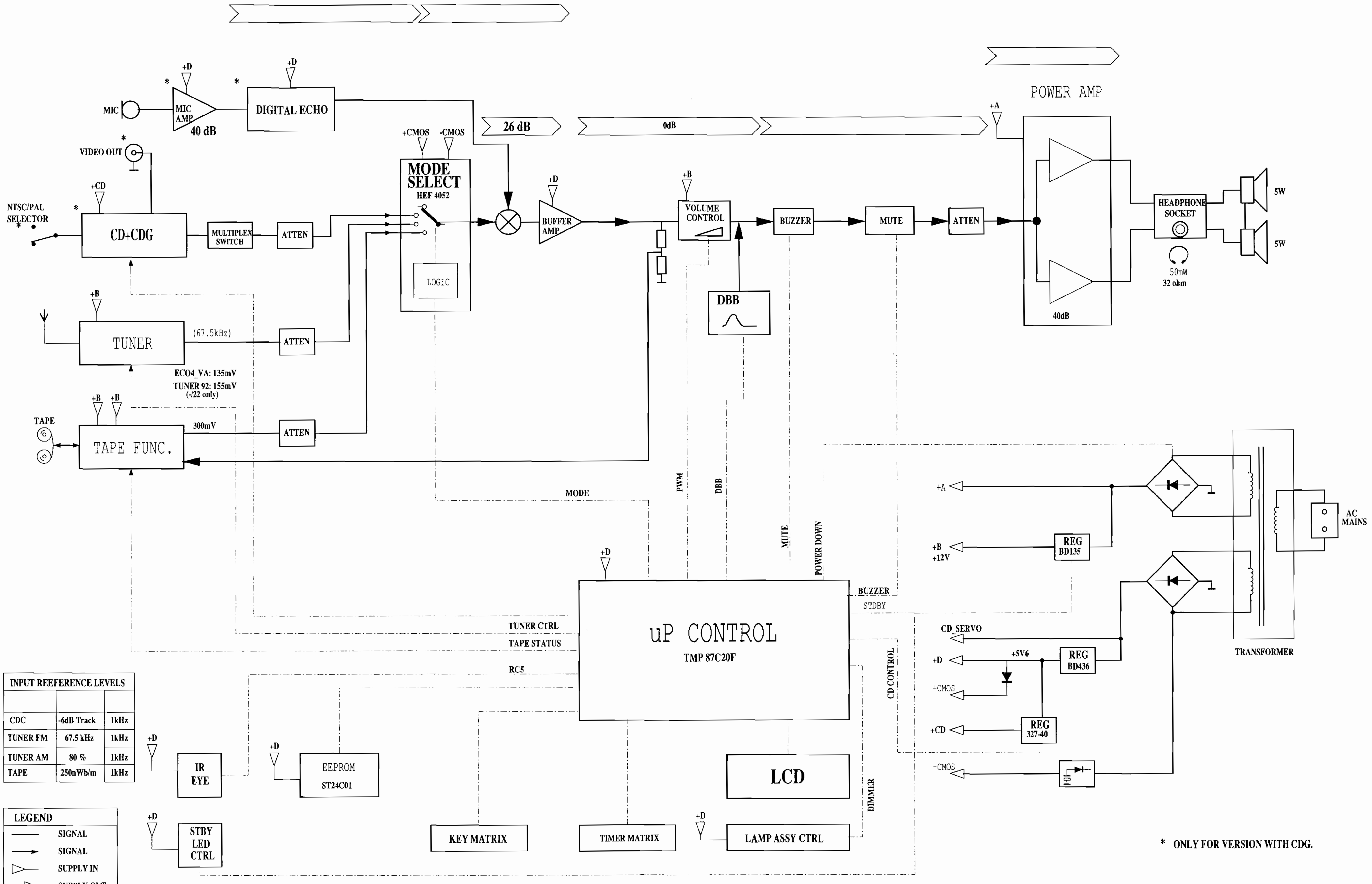
* SBC 420 : 4822 397 30071

** a The maximum permissible speed deviation is 2%.
Moreover, the wow and flutter value can be read.
This value should not exceed 0.4%.

DISASSEMBLY DRAWING
Sequence A-B-C-D-E-F-G


A
C
C1
C2
C3
F
B
E
D
G
PRESSURE
PUSH-UP

BLOCK DRAWING

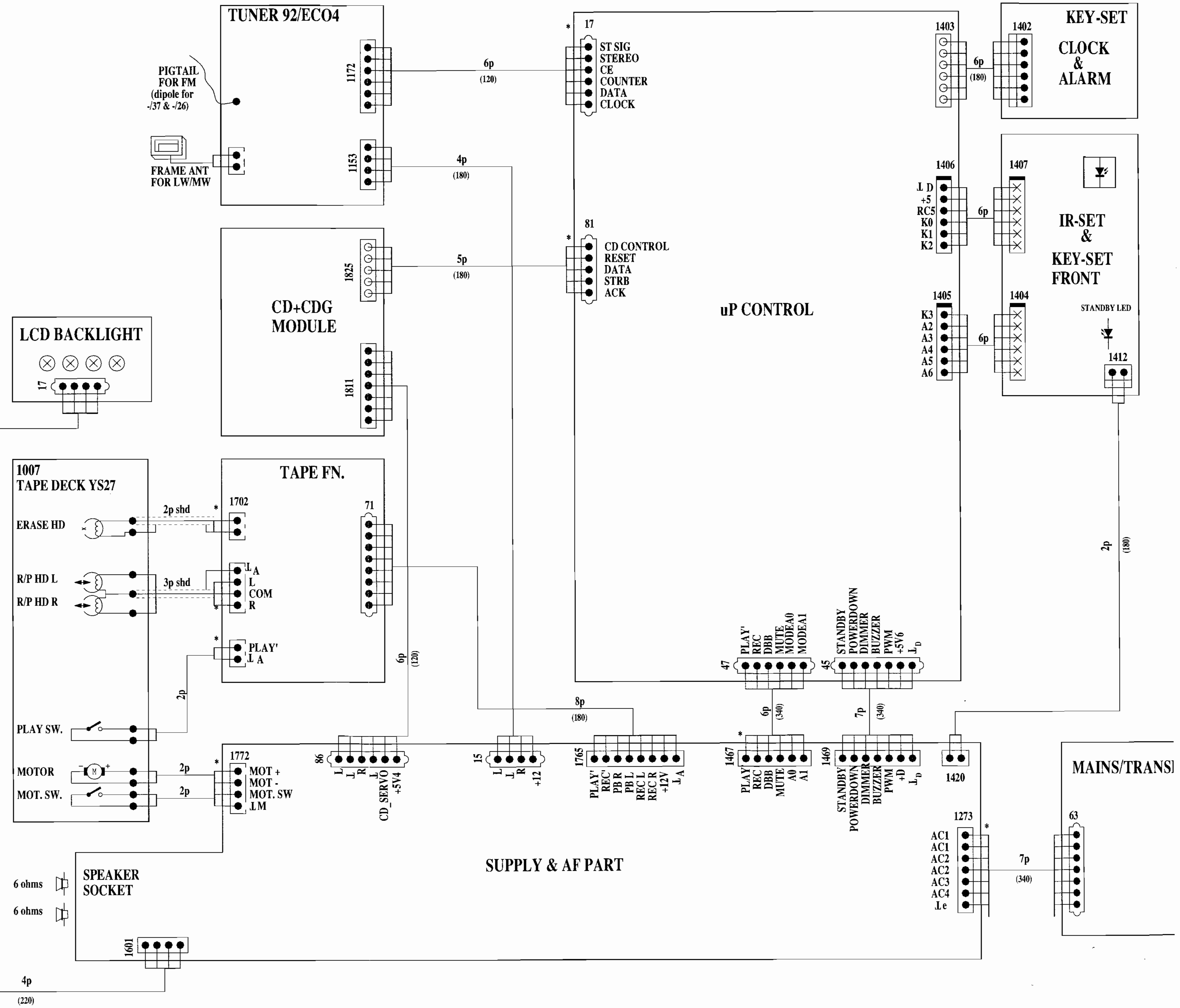

MIC
MIC AMP
40 dB
+D
*
DIGITAL ECHO
VIDEO OUT
NTSC/PAL SELECTOR
+CD
CD+CDG
MULTIPLEX SWITCH
ATTEN
+CMOS
-CMOS
MODE SELECT
HEF 4052
LOGIC
26 dB
0dB
+B
TUNER
(67.5kHz)
ECO4_VA: 135mV
TUNER 92: 155mV
(-/22 only)
TAPE
TAPE FUNC.
300mV
BUFFER AMP
VOLUME CONTROL
DBB
BUZZER
MUTE
POWER AMP
+A
40dB
HEADPHONE SOCKET
50mW
32 ohm
5W
5W
MODE
PWM
DBB
MUTE
POWER DOWN
BUZZER
STDBY
uP CONTROL
TMP 87C20F
TUNER CTRL
TAPE STATUS
RC5
CD CONTROL
DIMMER
IR EYE
EEPROM
ST24C01
LCD
KEY MATRIX
TIMER MATRIX
LAMP ASSY CTRL
STBY LED CTRL
+A
+B
+12V
REG
BD135
CD_SERVO
+D
+5V6
REG
BD436
+CMOS
+CD
REG
327-40
-CMOS
TRANSFORMER
AC MAINS

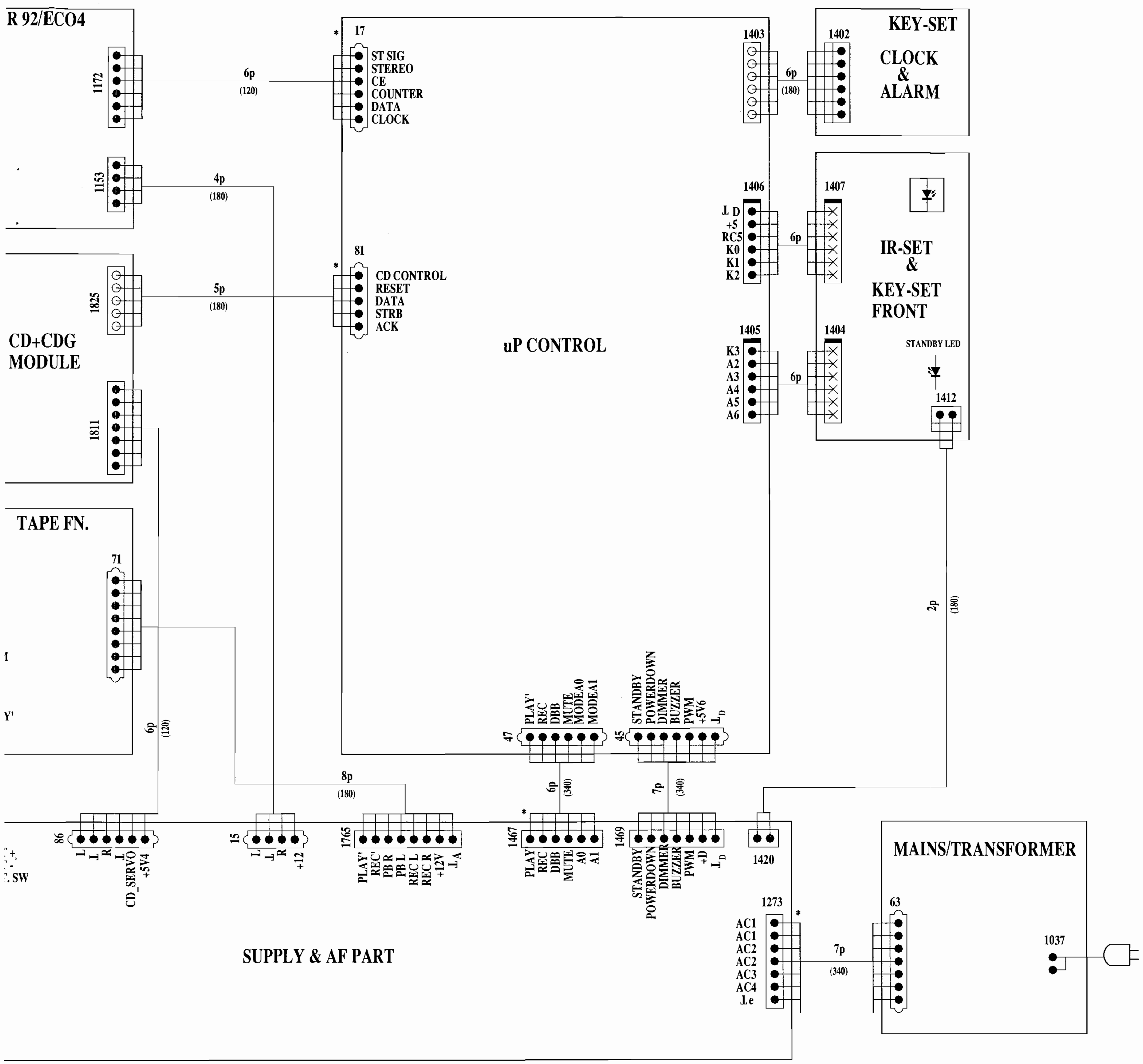
* ONLY FOR VERSION WITH CDG.

INPUT REEFERENCE LEVELS		
CDC	-6dB Track	1kHz
TUNER FM	67.5 kHz	1kHz
TUNER AM	80 %	1kHz
TAPE	250nWb/m	1kHz

LEGEND	
——	SIGNAL
——►	SIGNAL
▷—	SUPPLY IN
—▷	SUPPLY OUT
-·-·-	CONTROL
⊗	SUM PT.
XXdB	GAIN INDICATION

WIRING DIAGRAM


TUNER 92/ECO4
PIGTAIL FOR FM (dipole for -/37 & -/26)
FRAME ANT FOR LW/MW
1172
1153
6p (120)
4p (180)
CD+CDG MODULE
1825
1811
5p (180)
LCD BACKLIGHT
17
1007 TAPE DECK YS27
ERASE HD
R/P HD L
R/P HD R
PLAY SW.
MOTOR
MOT. SW.
2p shd
3p shd
2p
TAPE FN.
1702
71
A
L
COM
R
PLAY'
A
6p (120)
8p (180)
17
ST SIG
STEREO
CE
COUNTER
DATA
CLOCK
81
CD CONTROL
RESET
DATA
STRB
ACK
uP CONTROL
1403
6p (180)
1402
KEY-SET
CLOCK & ALARM
1406
D
+5
RC5
K0
K1
K2
6p
1407
IR-SET & KEY-SET FRONT
1405
K3
A2
A3
A4
A5
A6
6p
1404
STANDBY LED
1412
2p (180)
47
PLAY'
REC
DBB
MUTE
MODEA0
MODEA1
45
STANDBY
POWERDOWN
DIMMER
BUZZER
PWM
+5V6
D
6p (340)
7p (340)
1772
MOT +
MOT -
MOT. SW
M
86
L
R
CD_SERVO
+5V4
15
L
R
+12
1765
PLAY'
REC'
PB R
PB L
REC L
REC R
+12V
A
1467
PLAY
REC
DBB
MUTE
A0
A1
1469
STANDBY
POWERDOWN
DIMMER
BUZZER
PWM
+D
D
1420
1273
AC1
AC1
AC2
AC2
AC3
AC4
e
7p (340)
63
MAINS/TRANS
SUPPLY & AF PART
SPEAKER SOCKET
6 ohms
6 ohms
1601
4p (220)



R 92/ECO4
1172
1153
6p
(120)
4p
(180)
CD+CDG MODULE
1825
1811
5p
(180)
TAPE FN.
71
6p
(120)
8p
(180)
uP CONTROL
17
ST SIG
STEREO
CE
COUNTER
DATA
CLOCK
81
CD CONTROL
RESET
DATA
STRB
ACK
1403
6p
(180)
1402
KEY-SET
CLOCK & ALARM
1406
⏊ D
+5
RC5
K0
K1
K2
6p
1407
IR-SET & KEY-SET FRONT
1405
K3
A2
A3
A4
A5
A6
6p
1404
STANDBY LED
1412
2p
(180)
47
PLAY'
REC
DBB
MUTE
MODEA0
MODEA1
45
STANDBY
POWERDOWN
DIMMER
BUZZER
PWM
+5V6
⏊D
6p
(340)
7p
(340)
86
L
⏊
R
⏊
CD_SERVO
+5V4
15
L
⏊
R
+12
1765
PLAY'
REC'
PB R
PB L
REC L
REC R
+12V
⏊A
1467
PLAY'
REC
DBB
MUTE
A0
A1
1469
STANDBY
POWERDOWN
DIMMER
BUZZER
PWM
+D
⏊D
1420
SUPPLY & AF PART
1273
AC1
AC1
AC2
AC2
AC3
AC4
⏊e
7p
(340)
MAINS/TRANSFORMER
63
1037
1
Y'
SW

* DENOTES PIN 1 OF CONNECTOR

DIPMATE

JST XH TOP (MALE)

JST XH SIDE (MALE)

JC SIDE (MALE)

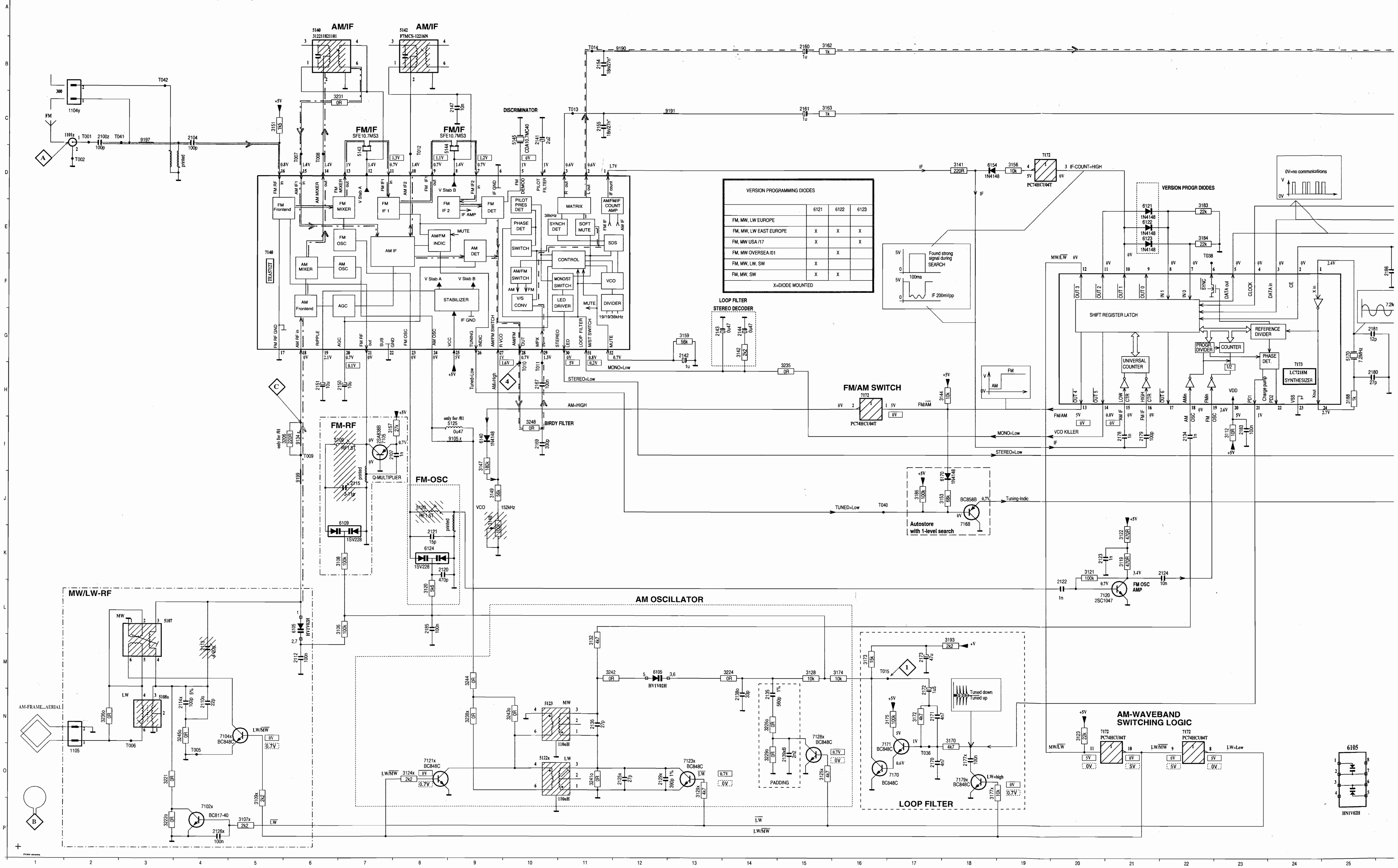
BACK ENTRY FEMALE

BACK ENTRY MALE

SPACER

KOIDE XC25 BOARD-IN
(SIDE ENTRY)

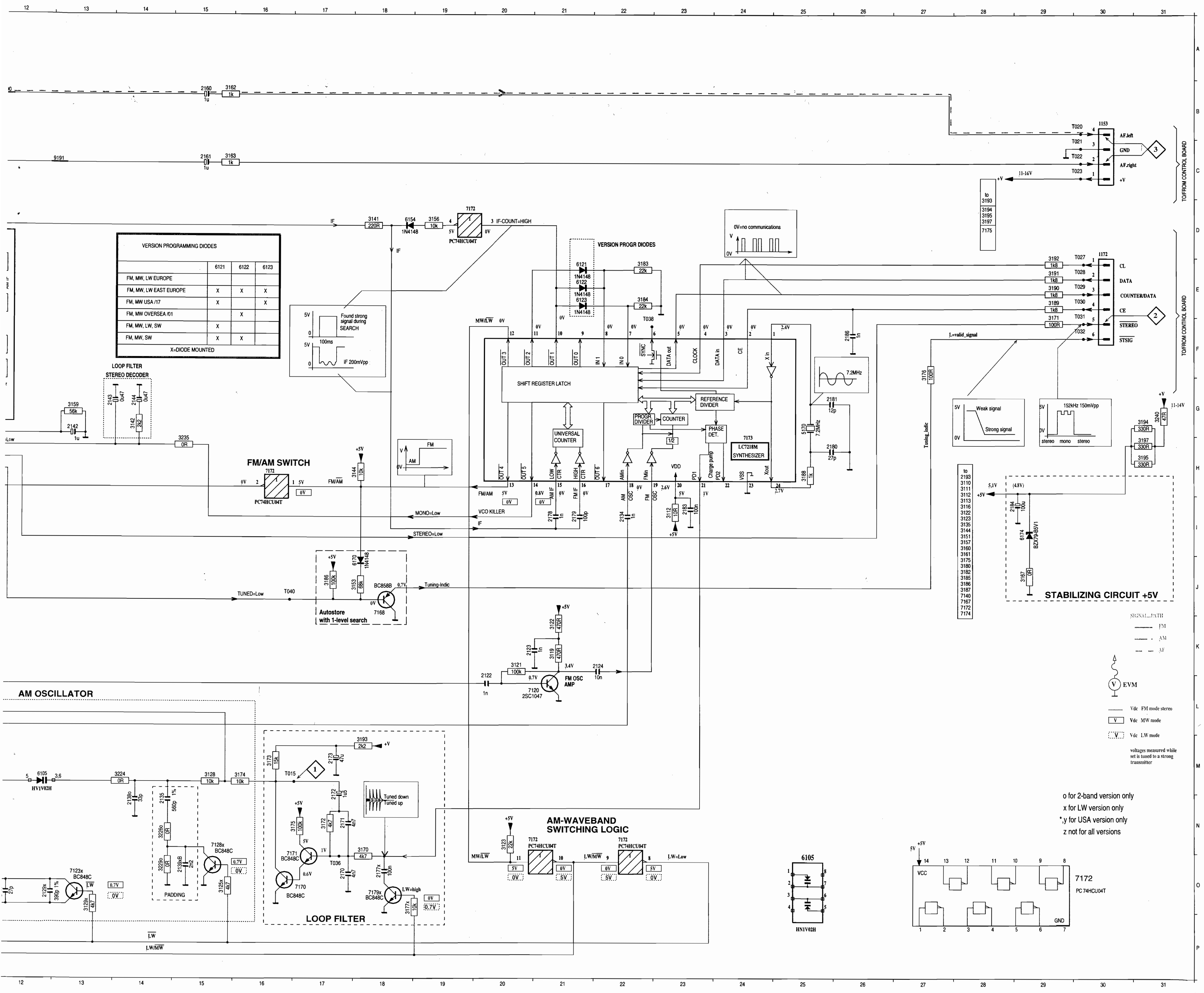
TUNER UNIT ECO4-VA (MINI)



AM/IF
5140 312211821101
5142 F7MCS-12216N
FM/IF SFE10.7MS3
DISCRIMINATOR
CDA10.7MC40
FM-RF
Q-MULTIPLIER
FM-OSC
MW/LW-RF
AM OSCILLATOR
PADDING
LOOP FILTER
LOOP FILTER STEREO DECODER
BIRDY FILTER
FM/AM SWITCH
PC74HCU04T
Autostore with 1-level search
FM OSC AMP
AM-WAVEBAND SWITCHING LOGIC
VERSION PROGR DIODES
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
REFERENCE DIVIDER
PROGR. DIVIDER
COUNTER
PHASE DET.
LC7218M SYNTHESIZER
7140 TEA5712T
FM Frontend
FM MIXER
FM OSC
AM MIXER
AM OSC
AM Frontend
AGC
AM IF
FM IF 1
FM IF 2
IF AMP
FM DET
AM/FM INDIC
AM DET
STABILIZER
PILOT PRES DET
PHASE DET
SWITCH
AM/FM SWITCH
V/S CONV
SYNCH DET
SOFT MUTE
MATRIX
CONTROL
MONO/ST SWITCH
LED DRIVER
MUTE
SDS
VCO
DIVIDER 19/19/38kHz
AM/FM/IF COUNT AMP
Found strong signal during SEARCH
100ms
IF 200mVpp
0V=no communications
Tuned down Tuned up
AM-FRAME_AERIAL
MONO=Low
STEREO=Low
TUNED=Low
AM=HIGH
IF-COUNT=HIGH
VCO KILLER
Tuning-Indic
LW/MW
LW=Low
LW=high
6105 HN1V02H

VERSION PROGRAMMING DIODES	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	

X=DIODE MOUNTED


AM OSCILLATOR
FM/AM SWITCH
LOOP FILTER
STEREO DECODER
VERSION PROGR DIODES
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
PROGR DIVIDER
COUNTER
REFERENCE DIVIDER
PHASE DET.
7173
LC7218M SYNTHESIZER
7172
PC74HCU04T
3 IF-COUNT=HIGH
MW/LW
MONO=Low
STEREO=Low
VCO KILLER
TUNED=Low
Tuning-Indic
Autostore
with 1-level search
FM OSC AMP
7120
2SC1047
LOOP FILTER
PADDING
Tuned down
Tuned up
LW=high
AM-WAVEBAND
SWITCHING LOGIC
LW/MW
LW=Low
LW
LW/MW
7123x
BC848C
7128x
BC848C
7171
BC848C
7170
BC848C
7179x
BC848C
7168
BC858B
HV1V02H
6105
HN1V02H
0V=no communications
Found strong signal during SEARCH
100ms
IF 200mVpp
7.2MHz
Weak signal
Strong signal
152kHz 150mVpp
stereo mono stereo
1153
AF.left
GND
AF.right
+V
1172
CL
DATA
COUNTER/DATA
CE
STEREO
STSIG
TO/FROM CONTROL BOARD
11-16V
11-14V
L=valid_signal
Tuning_indic
STABILIZING CIRCUIT +5V
5,1V
(4,8V)
BZX79-B5V1
SIGNAL PATH
FM
AM
AF
EVM
VCC
GND
7172
PC 74HCU04T

VERSION PROGRAMMING DIODES

	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	

X=DIODE MOUNTED

……… Vdc FM mode stereo

V Vdc MW mode

V Vdc LW mode

voltages measured while set is tuned to a strong transmitter

o for 2-band version only
x for LW version only
*,y for USA version only
z not for all versions

1101z	C 1
1104y	C 2
1105	O 2
1153	B30
1172	D30
2100z	C 2
2104	C 4
2107	I 8
2110o	N 4
2112	N 6
2113	M 4
2114x	N 4
2115	J 7
2120	K 8
2121	K 8
2122	K20
2123	K20
2124	K22
2125x	O12
2126x	P 4
2129x	O12
2134	I22
2135	N14
2136	N11
2138o	N14
2139x	O15
2141	C10
2142	G13
2143	G13
2144	G14
2147	C 9
2150	H 7
2151	H 6
2154	C11
2155	C12
2160	B15
2161	C15
2167	H10
2169	I10
2170	O17
2171	N17
2172	M17
2173	M17
2177x	O18
2178	I21
2179	I21
2180	H25
2181	G25
2183	I23
2184	I29
2185	L 8
2186	F26
3106	L 7
3107x	P 5
3108	K 7
3109x	O 5
3112	I23
3119	K21
3120	L 8
3121	K20
3122	K21
3123	N20
3124x	O 8
3125x	O15
3128	M15
3129x	O13
3132	M12
3141	D18
3142	G14
3144	H18
3147	I 9
3148	J 9
3149	J 9
3151	C 4
3153	J18
3156	D19
3157	I 7
3159	G13
3162	B15
3163	C15
3167	J29
3170	N18
3171	F29
3172	N17
3173	M16
3174	M16
3175	N17
3176	F27
3177x	O18
3183	E22
3184	E22
3186	J17
3188	H25
3189	E29
3190	E29
3191	E29
3192	E29
3193	M18
3194	G31
3195	H31
3197	H31
3206	I 6
3221	O 3
3222o	P 3
3224	M14
3226o	N14
3229o	O14
3231	C 7
3235	H15
3236o	N 2
3238x	N 9
3240	G31
3241o	O11
3242	N11
3243o	N10
3244	M 9
3245o	N 4
3248	I10
5107	M 2
5108x	N 3
5109	I 7
5120	J 8
5122x	O10
5123	N10
5125	I 9
5140	A 6
5142	A 8
5143	D 7
5144	D 9
5145	C10
5170	G25
6105	M12
6105	N6
6109	J 7
6121	E21
6122	E21
6123	E21
6124	K 8
6140	I 9
6154	D18
6170	J18
6174	I29
7102x	P 4
7104x	N 5
7105	I 7
7120	L20
7121x	O 8
7123x	O13
7128x	N15
7140	E 5
7168	J18
7170	O17
7171	O17
7172	H16
7172	D20
7172	O20
7172	N22
7172	N20
7172	O22
7173	H24
7179x	O18
9105	I 9
9134	I 6
9190	B12
9191	C13
9197	C 3
9199	J 6

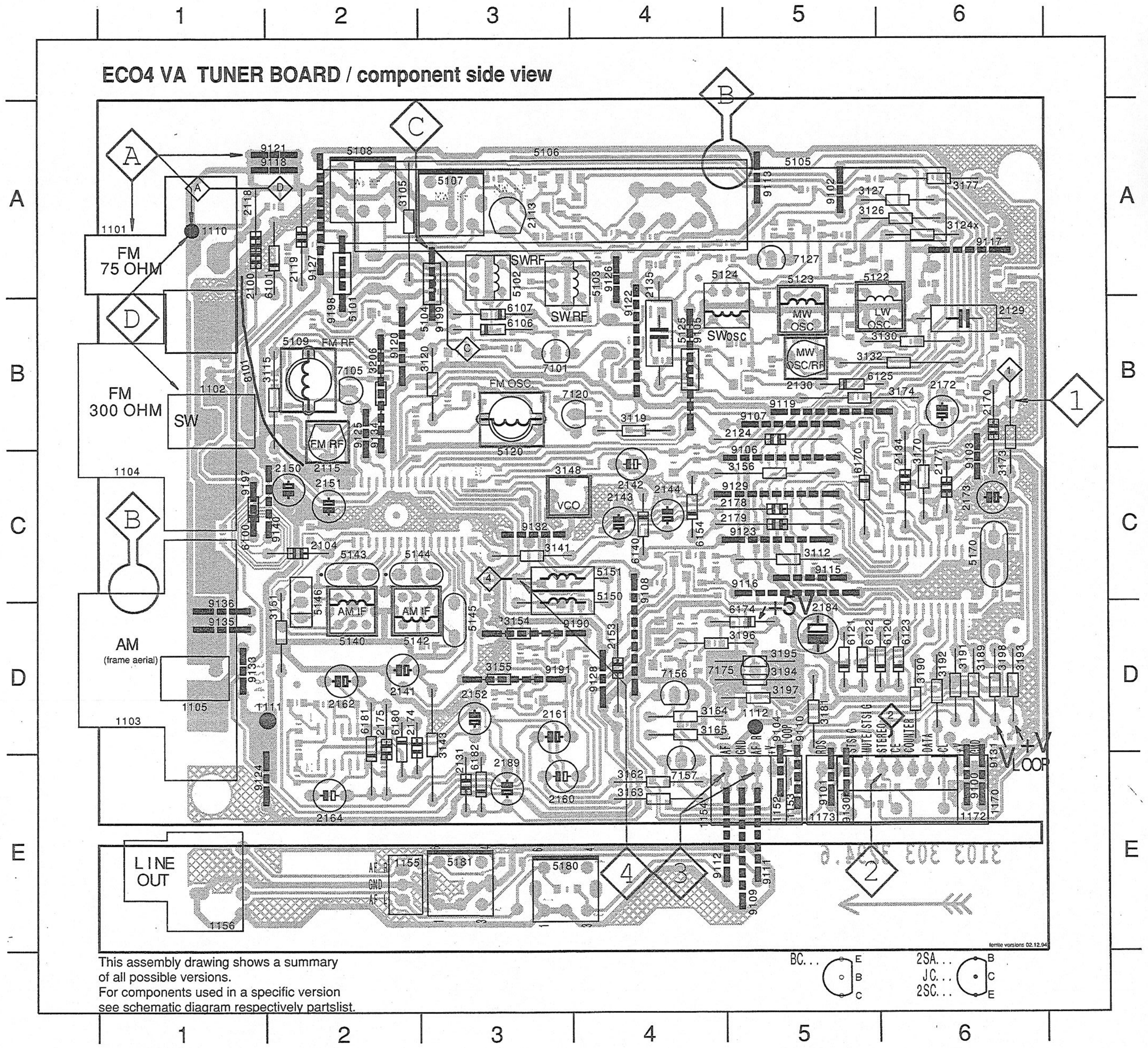
T001	C 2
T002	D 2
T005	O 4
T006	O 3
T007	D 6
T008	D 6
T009	I 6
T010	H10
T011	H10
T012	C 8
T013	C11
T014	B11
T015	M16
T020	B29
T021	C29
T022	C29
T023	C29
T027	D30
T028	E30
T029	E30
T030	E30
T031	E30
T032	F30
T033	F30
T036	O17
T038	F22
T040	J13
T041	C 2
T042	B 3

EC04VA LAYOUT

1101 A 1	1173 E 5	2142 C 4	2175 D 2	3127 A 6	3173 B 6	5101 A 2	5142 D 2	6121 D 5	7156 D 4	9111 E 5	9127 A 2	9199 A 3
1102 B 1	2100 A 1	2143 C 4	2177 C 6	3130 B 6	3174 B 5	5102 A 3	5143 C 2	6122 D 5	7157 E 4	9112 E 4	9128 D 4	
1103 D 1	2104 C 2	2144 C 4	2178 C 5	3132 B 6	3177 A 6	5103 A 3	5144 C 2	6123 D 6	7175 D 5	9113 A 5	9129 C 5	
1104 B 1	2106 B 4	2150 C 2	2179 C 5	3141 C 3	3181 D 5	5104 A 3	5145 D 3	6125 B 5	8101 B 1	9115 C 5	9130 E 5	
1105 D 1	2113 A 3	2151 C 2	2184 D 5	3143 D 3	3189 D 6	5105 A 4	5146 D 2	6140 C 4	9100 E 6	9116 C 5	9131 E 6	
1110 A 1	2115 B 2	2152 D 3	2189 E 3	3148 C 3	3190 D 6	5106 A 4	5150 D 3	6154 C 4	9101 E 5	9117 A 6	9132 C 3	
1111 D 2	2118 A 1	2153 D 4	2190 A 2	3151 D 2	3191 D 6	5107 A 3	5151 C 3	6170 C 5	9102 A 5	9118 A 2	9133 D 1	
1112 D 5	2119 A 2	2160 E 3	2191 A 6	3154 D 3	3192 D 6	5108 A 2	5170 C 6	6174 D 5	9103 C 6	9119 B 5	9134 B 2	
1152 E 5	2124 B 5	2161 D 3	3105 A 2	3155 D 3	3193 D 6	5109 B 2	5180 E 3	6180 D 2	9104 E 5	9120 B 2	9135 D 1	
1153 E 5	2129 B 6	2162 D 2	3112 C 5	3156 C 5	3194 D 5	5120 B 3	5181 E 3	6181 D 2	9105 B 4	9121 A 2	9136 D 1	
1154 E 4	2130 B 5	2164 E 2	3115 B 2	3162 E 4	3195 D 5	5122 B 6	6100 C 1	6182 E 3	9106 C 5	9122 B 4	9140 C 2	
1155 E 2	2131 E 3	2170 B 6	3119 B 4	3163 E 4	3196 D 4	5123 B 5	6101 A 2	7101 B 3	9107 B 5	9123 C 5	9190 D 3	
1156 E 1	2134 C 6	2172 B 6	3120 B 3	3164 D 4	3197 D 5	5124 B 5	6106 B 3	7105 B 2	9108 D 4	9124 E 1	9191 D 3	
1170 E 6	2135 B 4	2173 C 6	3124 A 6	3165 D 4	3198 D 6	5125 B 4	6107 B 3	7120 B 4	9109 E 5	9125 B 2	9197 C 1	
1172 E 6	2141 D 2	2174 D 2	3126 A 6	3170 C 6	3206 B 2	5140 D 2	6120 D 6	7127 A 5	9110 E 5	9126 A 4	9198 A 2	

o for AM-version only
x for LW-version only
y for USA version only
z not for all versions

ECO4 VA TUNER BOARD / component side view

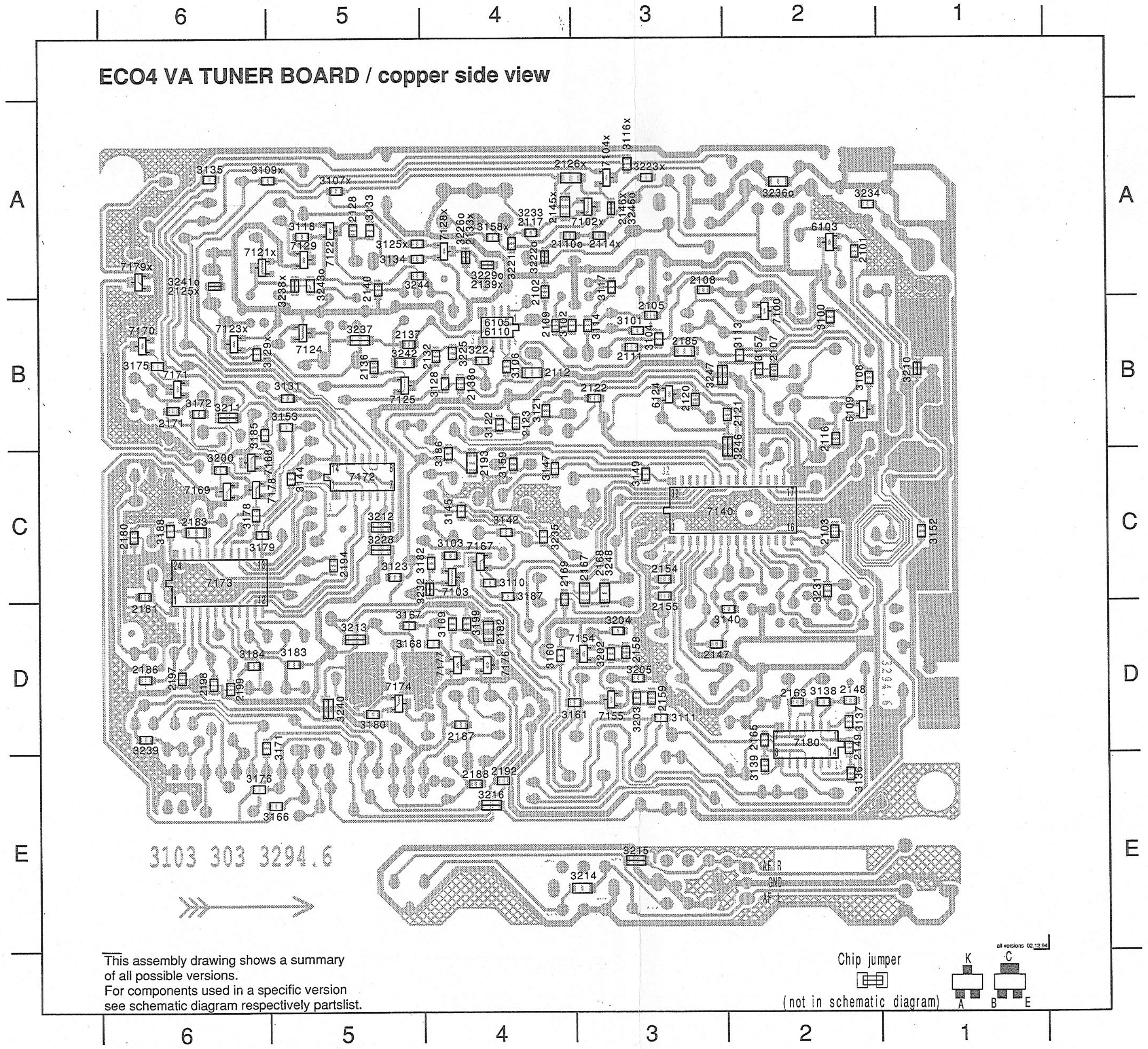


This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

2101 A 2	2122 B 3	2148 D 2	2183 C 6	3104 B 3	3125x A 5	3147 C 4	3175 B 6	3203 D 3	3226o A 4	3243o A 5	7121x A 6	7172 C 5
2102 A 4	2123 B 4	2149 D 2	2185 B 3	3106 B 4	3128 B 4	3149 C 3	3176 E 6	3204 D 3	3228 C 5	3244 A 5	7122 A 5	7173 C 6
2103 C 2	2125x A 6	2154 C 3	2186 D 6	3107x A 5	3129x B 6	3152 C 1	3178 C 6	3205 D 3	3229o A 4	3245o A 3	7123x B 6	7174 D 5
2105 B 3	2126x A 3	2155 C 3	2187 D 4	3108 B 2	3131 B 5	3153 B 5	3179 C 6	3210 B 1	3231 C 2	3246 B 2	7124 B 5	7176 D 4
2107 B 2	2128 A 5	2158 D 3	2188 E 4	3109x A 5	3133 A 5	3157 B 2	3180 D 5	3211 B 6	3232 C 4	3247 B 3	7125 B 5	7177 D 4
2108 A 3	2132 B 4	2159 D 3	2192 E 4	3110 C 4	3134 A 5	3158x A 4	3182 C 4	3212 C 5	3233 A 4	3248 C 3	7128x A 4	7178 C 6
2109 B 4	2133x A 4	2163 D 2	2193 C 4	3111 D 3	3135 A 6	3159 C 4	3183 D 5	3213 D 5	3234 A 2	6103 A 2	7129 A 5	7179x A 6
2110o A 4	2136 B 5	2165 E 2	2194 C 5	3113 B 2	3136 E 2	3160 D 4	3184 D 6	3214 E 3	3235 C 4	6105 B 4	7140 C 2	7180 D 2
2111 B 3	2137 B 5	2167 C 3	2197 D 6	3114 B 3	3137 D 2	3161 D 3	3185 B 6	3215 E 3	3236o A 2	6109 B 2	7154 D 3	
2112 B 4	2138o B 4	2168 C 3	2198 D 6	3116x A 3	3138 D 2	3166 E 5	3186 C 4	3216 E 4	3237 B 5	6110 B 4	7155 D 3	
2114x A 3	2139x A 4	2169 C 4	2199 D 6	3117 A 3	3139 D 2	3167 D 5	3187 C 4	3221 A 4	3238x A 5	6124 B 3	7167 C 4	
2116 B 2	2140 A 5	2171 B 6	3100 B 2	3118 A 5	3140 D 2	3168 D 4	3188 C 6	3222o A 4	3239 D 6	7100 B 2	7168 C 6	
2117 A 4	2145x A 4	2180 C 6	3101 B 3	3121 B 4	3142 C 4	3169 D 4	3199 D 4	3223x A 3	3240 D 5	7102x A 3	7169 C 6	
2120 B 3	2146x A 3	2181 C 6	3102 B 3	3122 B 4	3144 C 5	3171 D 6	3200 C 6	3224 B 4	3241o A 6	7103 C 4	7170 B 6	
2121 B 2	2147 D 3	2182 D 4	3103 C 4	3123 C 5	3145 C 4	3172 B 6	3202 D 3	3225 B 4	3242 B 5	7104x A 3	7171 B 6	

o for AM-version only
x for LW-version only
y for USA version only
z not for all versions

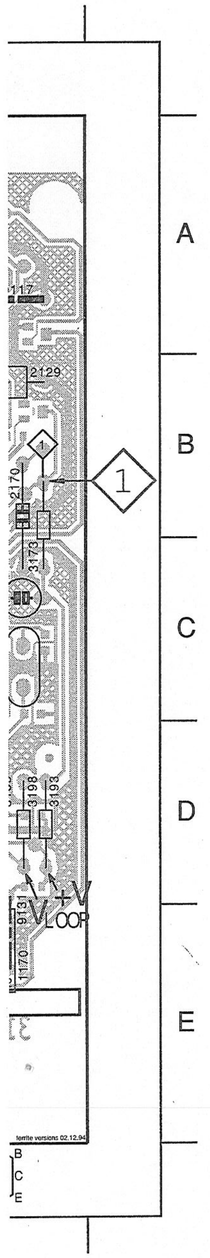
ECO4 VA TUNER BOARD / copper side view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

99 A 3

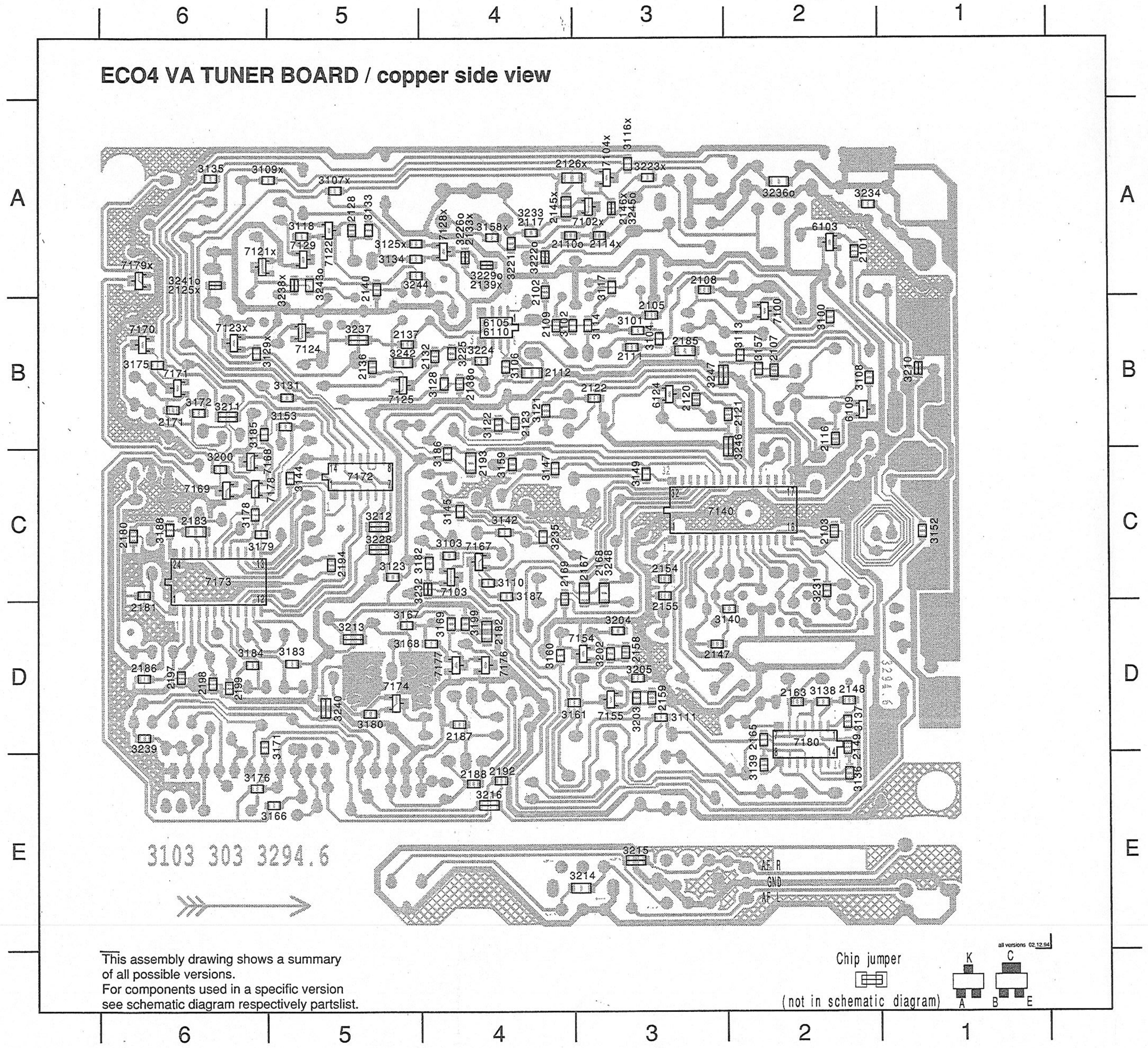
for AM-version only
for LW-version only
for USA version only
not for all versions



2101	A 2	2122	B 3	2148	D 2	2183	C 6	3104	B 3	3125x	A 5	3147	C 4	3175	B 6	3203	D 3	3226o	A 4	3243o	A 5	7121x	A 6	7172	C 5
2102	A 4	2123	B 4	2149	D 2	2185	B 3	3106	B 4	3128	B 4	3149	C 3	3176	E 6	3204	D 3	3228	C 5	3244	A 5	7122	A 5	7173	C 6
2103	C 2	2125x	A 6	2154	C 3	2186	D 6	3107x	A 5	3129x	B 6	3152	C 1	3178	C 6	3205	D 3	3229o	A 4	3245o	A 3	7123x	B 6	7174	D 5
2105	B 3	2126x	A 3	2155	C 3	2187	D 4	3108	B 2	3131	B 5	3153	B 5	3179	C 6	3210	B 1	3231	C 2	3246	B 2	7124	B 5	7176	D 4
2107	B 2	2128	A 5	2158	D 3	2188	E 4	3109x	A 5	3133	A 5	3157	B 2	3180	D 5	3211	B 6	3232	C 4	3247	B 3	7125	B 5	7177	D 4
2108	A 3	2132	B 4	2159	D 3	2192	E 4	3110	C 4	3134	A 5	3158x	A 4	3182	C 4	3212	C 5	3233	A 4	3248	C 3	7128x	A 4	7178	C 6
2109	B 4	2133x	A 4	2163	D 2	2193	C 4	3111	D 3	3135	A 6	3159	C 4	3183	D 5	3213	D 5	3234	A 2	6103	A 2	7129	A 5	7179x	A 6
2110o	A 4	2136	B 5	2165	E 2	2194	C 5	3113	B 2	3136	E 2	3160	D 4	3184	D 6	3214	E 3	3235	C 4	6105	B 4	7140	C 2	7180	D 2
2111	B 3	2137	B 5	2167	C 3	2197	D 6	3114	B 3	3137	D 2	3161	D 3	3185	B 6	3215	E 3	3236o	A 2	6109	B 2	7154	D 3		
2112	B 4	2138o	B 4	2168	C 3	2198	D 6	3116x	A 3	3138	D 2	3166	E 5	3186	C 4	3216	E 4	3237	B 5	6110	B 4	7155	D 3		
2114x	A 3	2139x	A 4	2169	C 4	2199	D 6	3117	A 3	3139	D 2	3167	D 5	3187	C 4	3221	A 4	3238x	A 5	6124	B 3	7167	C 4		
2116	B 2	2140	A 5	2171	B 6	3100	B 2	3118	A 5	3140	D 2	3168	D 4	3188	C 6	3222o	A 4	3239	D 6	7100	B 2	7168	C 6		
2117	A 4	2145x	A 4	2180	C 6	3101	B 3	3121	B 4	3142	C 4	3169	D 4	3199	D 4	3223x	A 3	3240	D 5	7102x	A 3	7169	C 6		
2120	B 3	2146x	A 3	2181	C 6	3102	B 3	3122	B 4	3144	C 5	3171	D 6	3200	C 6	3224	B 4	3241o	A 6	7103	C 4	7170	B 6		
2121	B 2	2147	D 3	2182	D 4	3103	C 4	3123	C 5	3145	C 4	3172	B 6	3202	D 3	3225	B 4	3242	B 5	7104x	A 3	7171	B 6		

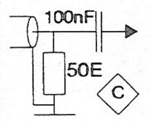
o for AM-version only
x for LW-version only
y for USA version only
z not for all versions

ECO4 VA TUNER BOARD / copper side view



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER Adjustment table (ECO4 VA FM/MW- and FM/MW/LW - versions with AM-frame aerial)

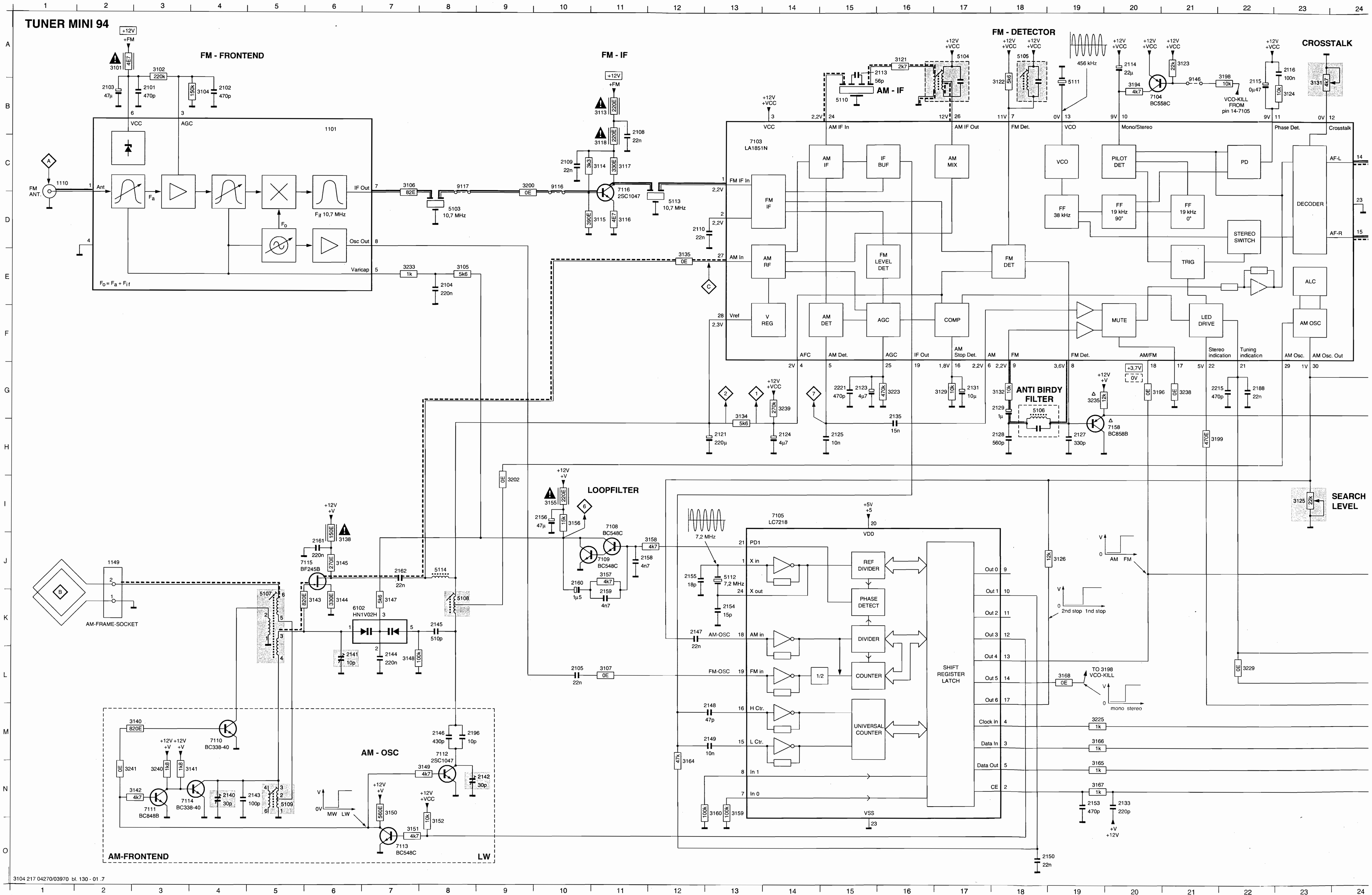
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM /00/01/05/10/17 87.5 - 108MHz			108 MHz	5120	1	8 ± 0.2V
			87.5MHz	check		4.1 ± 0.5V
FM /14 East Europe 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65.81 MHz	check		0.8 ± 0.4V
MW /01/17 2-band version 530 - 1710kHz			1710kHz	5123		9V ± 0.1V
			530kHz	check		1V ± 0.4V
LW /00/05/10/14 153 - 279kHz			279kHz	5122		8V ± 0.2V
			153kHz	check		1V ± 0.4V
MW /00/05/10/14 522 - 1611kHz			1611kHz	5123		8V ± 0.1V
			522kHz	check		1V ± 0.4V
FM - RF						
FM /00/01/05/10/17	108MHz	A mod=1kHz Δf=22.5kHz	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152 ± 1 kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	 100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF [1]						
LW	198kHz	B mod=1kHz 30% AM	198kHz	5108	4	MAX
MW 3-band version	1494kHz		1494kHz	2113		MAX ↕
	549kHz		549kHz	5107		
MW 2-band version	1500kHz		1500kHz	2113		
	550kHz		550kHz	5107		

* Use Service Test Program. By selecting the TUNER TEST test frequencies will be stored as preset frequ. automatically.

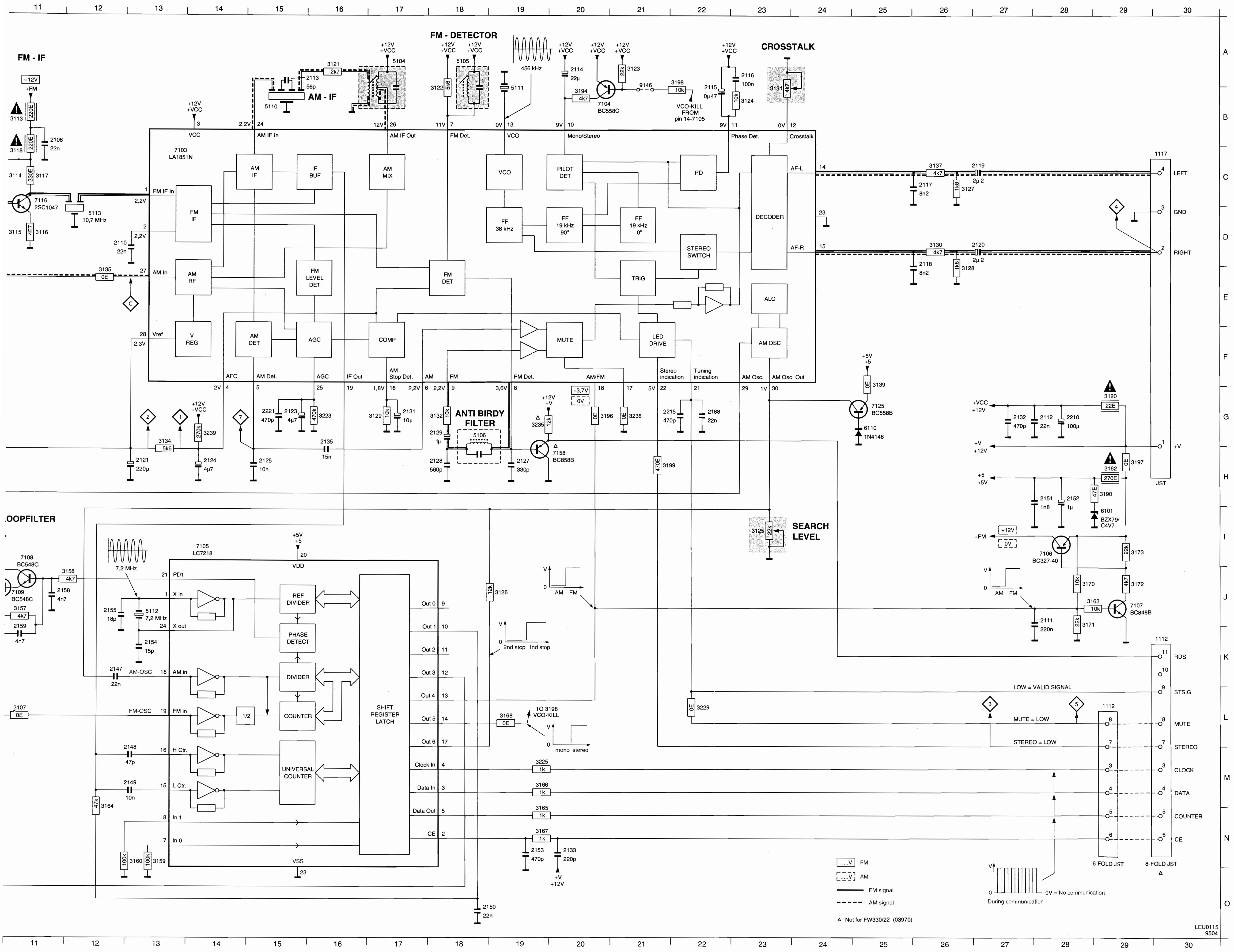
[1] For AM RF-adjustments the original frame antenna 4822 158 60622 has to be used!

↕ repeat

TUNER 92 CIRCUIT (For/22 only)



TUNER MINI 94
FM - FRONTEND
FM - IF
AM - IF
FM - DETECTOR
CROSSTALK
ANTI BIRDY FILTER
LOOPFILTER
SEARCH LEVEL
AM - OSC
AM-FRONTEND
LW
FM ANT.
1110
1101
Ant
VCC
AGC
IF Out
Osc Out
Varicap
Fa
Fo
Fif 10,7 MHz
Fo = Fa + Fif
+12V
+FM
3101 4E7
3102 220k
3103
2103 47µ
2101 470p
3104 150k
2102 470p
3106 82E
9117
3200 0E
9116
5103 10,7 MHz
3233 1k
3105 5k6
2104 220n
3113 220E
3118 220E
2108 22n
2109 22n
3114 3k3
3117 330E
7116 2SC1047
5113 10,7 MHz
3115 390E
3116 4E7
2110 22n
3135 0E
3121 2k7
5104
2113 56p
5110
5105
3122 5k6
456 kHz
5111
2114 22µ
3194 4k7
7104 BC558C
3123 22k
9146
3198 10k
VCO-KILL FROM pin 14-7105
2115 0µ47
2116 100n
3124 10k
3131 4k7
+12V +VCC
7103 LA1851N
FM IF In
AM IF In
AM IF Out
FM Det.
VCO
Mono/Stereo
Phase Det.
Crosstalk
AF-L
AF-R
AM In
Vref
AM IF
IF BUF
AM MIX
PILOT DET
PD
DECODER
FM IF
FF 38 kHz
FF 19 kHz 90°
FF 19 kHz 0°
STEREO SWITCH
AM RF
FM LEVEL DET
FM DET
TRIG
ALC
V REG
AM DET
AGC
COMP
MUTE
LED DRIVE
AM OSC
AFC
AM Det.
IF Out
AM Stop Det.
AM
FM
FM Det.
AM/FM
Stereo indication
Tuning indication
AM Osc.
AM Osc. Out
2,2V
2,3V
11V
0V
9V
12V
1,8V
3,6V
+3,7V
5V
1V
2221 470p
2123 4µ7
3223 470k
3239 270k
2121 220µ
3134 5k6
2124 4µ7
2125 10n
2135 15n
3129 10k
2131 10µ
3132 10k
2129 1µ
5106
2128 560p
2127 330p
3235 12k
7158 BC858B
3196 0E
3238 0E
2215 470p
2188 22n
3199 470E
3202 0E
3155 220E
2156 47µ
3156 15k
7108 BC546C
7109 BC548C
3158 4k7
2158 4n7
2160 1µ5
3157 4k7
2159 4n7
+12V +V
3138 150E
2161 220n
7115 BF245B
3145 270E
2162 22n
5114
5108
3143 820E
3144 330E
3147 5k6
6102 HN1V02H
2145 510p
2141 10p
2144 220n
3148 100k
2105 22n
3107 0E
1149
AM-FRAME-SOCKET
5107
3140 820E
7110 BC338-40
3241 0E
3240 1k8
3141 1k8
3142 4k7
7111 BC848B
7114 BC338-40
2140 30p
2143 100p
5109
2146 430p
2196 10p
7112 2SC1047
3149 4k7
2142 30p
3150 560E
3152 10k
3151 4k7
7113 BC548C
MW LW
7,2 MHz
7105 LC7218
+5V +5
VDD
PD1
X in
X out
AM in
FM in
H Ctr.
L Ctr.
In 1
In 0
VSS
2155 18p
5112 7,2 MHz
2154 15p
2147 22n
AM-OSC
FM-OSC
2148 47p
2149 10n
3164 47k
3160 100k
3159 100k
REF DIVIDER
PHASE DETECT
DIVIDER
COUNTER
1/2
UNIVERSAL COUNTER
SHIFT REGISTER LATCH
Out 0
Out 1
Out 2
Out 3
Out 4
Out 5
Out 6
Clock in
Data In
Data Out
CE
3126 12k
2nd stop 1nd stop
3168 0E
TO 3198 VCO-KILL
mono stereo
3225 1k
3166 1k
3165 1k
3167 1k
2153 470p
2133 220p
+V +12V
2150 22n
3125 22k
3229 0E
A
B
C
1
2
6
7
3104 217 04270/03970 bl. 130 - 01 .7


FM - IF
AM - IF
FM - DETECTOR
CROSSTALK
ANTI BIRDY FILTER
SEARCH LEVEL
LOOPFILTER
7103 LA1851N
7105 LC7218
7104 BC558C
7116 2SC1047
7158 BC858B
7125 BC558B
7106 BC327-40
7107 BC848B
7108 BC548C
7109 BC548C
5113 10,7 MHz
5112 7,2 MHz
456 kHz
VCO-KILL FROM pin 14-7105
TO 3198 VCO-KILL
FM IF In
AM IF In
AM IF Out
FM Det.
VCO
Mono/Stereo
Phase Det.
Crosstalk
AF-L
AF-R
AM IF
IF BUF
AM MIX
PILOT DET
PD
FF 38 kHz
FF 19 kHz 90°
FF 19 kHz 0°
DECODER
STEREO SWITCH
TRIG
ALC
AM OSC
FM LEVEL DET
FM DET
AM RF
V REG
AM DET
AGC
COMP
MUTE
LED DRIVE
AFC
AM Det.
IF Out
AM Stop Det.
Stereo indication
Tuning indication
AM Osc.
AM Osc. Out
PD1
X in
X out
AM in
FM in
H Ctr.
L Ctr.
In 1
In 0
VDD
VSS
REF DIVIDER
PHASE DETECT
DIVIDER
COUNTER
UNIVERSAL COUNTER
SHIFT REGISTER LATCH
Out 0
Out 1
Out 2
Out 3
Out 4
Out 5
Out 6
Clock In
Data In
Data Out
CE
AM-OSC
FM-OSC
1117
LEFT
GND
RIGHT
+V
JST
1112
RDS
STSIG
MUTE
STEREO
CLOCK
DATA
COUNTER
CE
6-FOLD JST
8-FOLD JST
LOW = VALID SIGNAL
MUTE = LOW
STEREO = LOW
2nd stop 1nd stop
mono stereo
During communication
0V = No communication
FM
AM
FM signal
AM signal
∆ Not for FW330/22 (03970)
LEU0115 9504

1101	B6	3196	G20
1110	C1	3197	H29
1112	L29	3198	A22
1112	K30	3199	H21
1117	C30	3200	C9
1149	J2	3202	I9
2101	B3	3223	G16
2102	B4	3225	M19
2103	B2	3229	L22
2104	E8	3233	E7
2105	L10	3235	G19
2108	B11	3238	G21
2109	C10	3239	G14
2110	D12	3240	N3
2111	J28	3241	N2
2112	G28	5103	D8
2113	A15	5104	A17
2114	A20	5105	A18
2115	B22	5106	G18
2116	A23	5107	K5
2117	C26	5108	K8
2118	D26	5109	N5
2119	C26	5110	B15
2120	D26	5111	B19
2121	H13	5112	J13
2123	G15	5113	D12
2124	H14	5114	J8
2125	H15	6101	I29
2127	H19	6102	K6
2128	H18	6110	G25
2129	G18	7103	C13
2131	G17	7104	B20
2132	G27	7105	I14
2133	N20	7106	I28
2135	G16	7107	J29
2140	N4	7108	I11
2141	L6	7109	J11
2142	N9	7110	M4
2143	N5	7111	N3
2144	L7	7112	M8
2145	K8	7113	O7
2146	M8	7114	N3
2147	K12	7115	J5
2148	M12	7116	C11
2149	M12	7125	G25
2150	O18	7158	H20
2151	H28	9116	C10
2152	H28	9117	C8
2153	N19	9146	B21
2154	K13		
2155	J12		
2156	I10		
2158	J11		
2159	K11		
2160	J10		
2161	J6		
2162	J7		
2188	G22		
2196	M8		
2210	G28		
2215	G21		
2221	G15		
3101	A2		
3102	A3		
3104	B4		
3105	E8		
3106	C7		
3107	L11		
3113	B11		
3114	C11		
3115	D11		
3116	D11		
3117	C11		
3118	C11		
3120	G29		
3121	A16		
3122	B18		
3123	A21		
3124	B23		
3125	I23		
3126	J19		
3127	C26		
3128	E26		
3129	G17		
3130	D26		
3131	B23		
3132	G18		
3134	G13		
3135	E12		
3137	C26		
3138	J6		
3139	G25		
3140	M2		
3141	N3		
3142	N2		
3143	K6		
3144	K6		
3145	J6		
3147	K7		
3148	L7		
3149	N7		
3150	N7		
3151	O7		
3152	O8		
3155	I10		
3156	I10		
3157	J11		
3158	J11		
3159	N13		
3160	N13		
3162	H29		
3163	J28		
3164	N12		
3165	N19		
3166	M19		
3167	N19		
3168	L19		
3170	J28		
3171	K28		
3172	J29		
3173	I29		
3190	H29		
3194	B20		

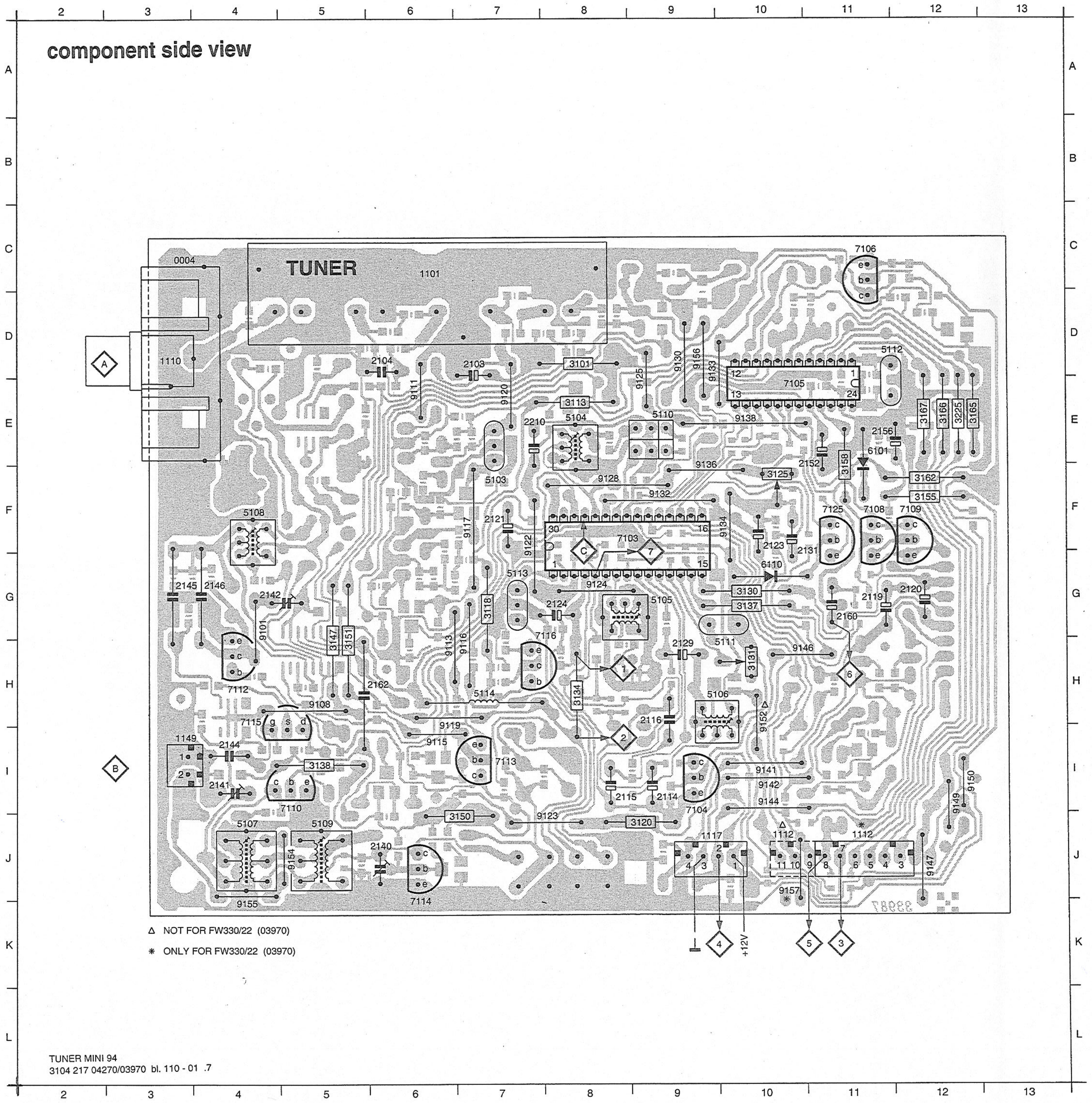
TUNER 92 LAYOUT (For/22 only)

0004	C3	1149	I3	2119	G11	2131	G10	2146	G4	3101	D8	3131	H10	3151	H5	3167	E12	5107	J4	5113	G7	7105	E10	7113	I7	9108	H5	9119	I6
1101	C6	2103	D7	2120	G12	2140	J6	2152	F10	3113	E8	3134	H8	3155	F12	3225	E12	5108	F4	5114	H7	7106	C11	7114	K6	9111	E6	9120	E7
1110	D3	2104	D6	2121	F7	2141	I4	2156	E11	3118	G7	3137	G10	3158	F11	5103	F7	5109	J5	6101	E11	7108	F11	7115	H4	9113	H6	9122	G7
1112	J10	2114	I9	2123	F10	2142	G4	2160	G11	3120	J9	3138	I5	3162	F12	5104	E8	5110	E9	6110	G10	7109	F12	7116	H7	9115	I6	9123	J7
1112	J11	2115	I8	2124	G8	2144	I4	2162	H5	3125	F10	3147	H5	3165	E12	5105	G9	5111	H9	7103	F8	7110	I5	7125	F11	9116	H7	9124	G8
1117	J9	2116	H9	2129	H9	2145	G3	2210	E7	3130	G10	3150	J6	3166	E12	5106	H9	5112	D11	7104	J9	7112	H4	9101	H4	9117	F7	9125	E9

9128	F8	9138	E10	9149	J12	9157	J10
9130	D9	9141	I10	9150	I12		
9132	F9	9142	I10	9152	I10		
9133	E9	9144	I10	9154	J5		
9134	F10	9146	H10	9155	K4		
9136	F9	9147	J12	9156	D9		

2101	C9	2110	F8	2118	F6	2133	J5	2149	E6	2155	D4	2196	G12	3105	E10	3116	G9	3124	I7	3132	G7	3142	J9	3149	H12	3160	D5
2102	D10	2111	E6	2125	F8	2135	G7	2150	F7	2158	G5	2215	I5	3106	D9	3117	H8	3126	F5	3135	F8	3143	I11	3152	E8	3163	C4
2105	D8	2112	G8	2127	F7	2143	J10	2151	E5	2159	G4	2221	H5	3107	D7	3121	E7	3127	G5	3139	F5	3144	H12	3156	F4	3164	E6
2108	E9	2113	E7	2128	H7	2147	E5	2153	D5	2161	I12	3102	D8	3114	H9	3122	G7	3128	G4	3140	I11	3145	I11	3157	G4	3168	F6
2109	H8	2117	G7	2132	I7	2148	E6	2154	E4	2188	G7	3104	D10	3115	H9	3123	J7	3129	F6	3141	J10	3148	G12	3159	D5	3170	C5

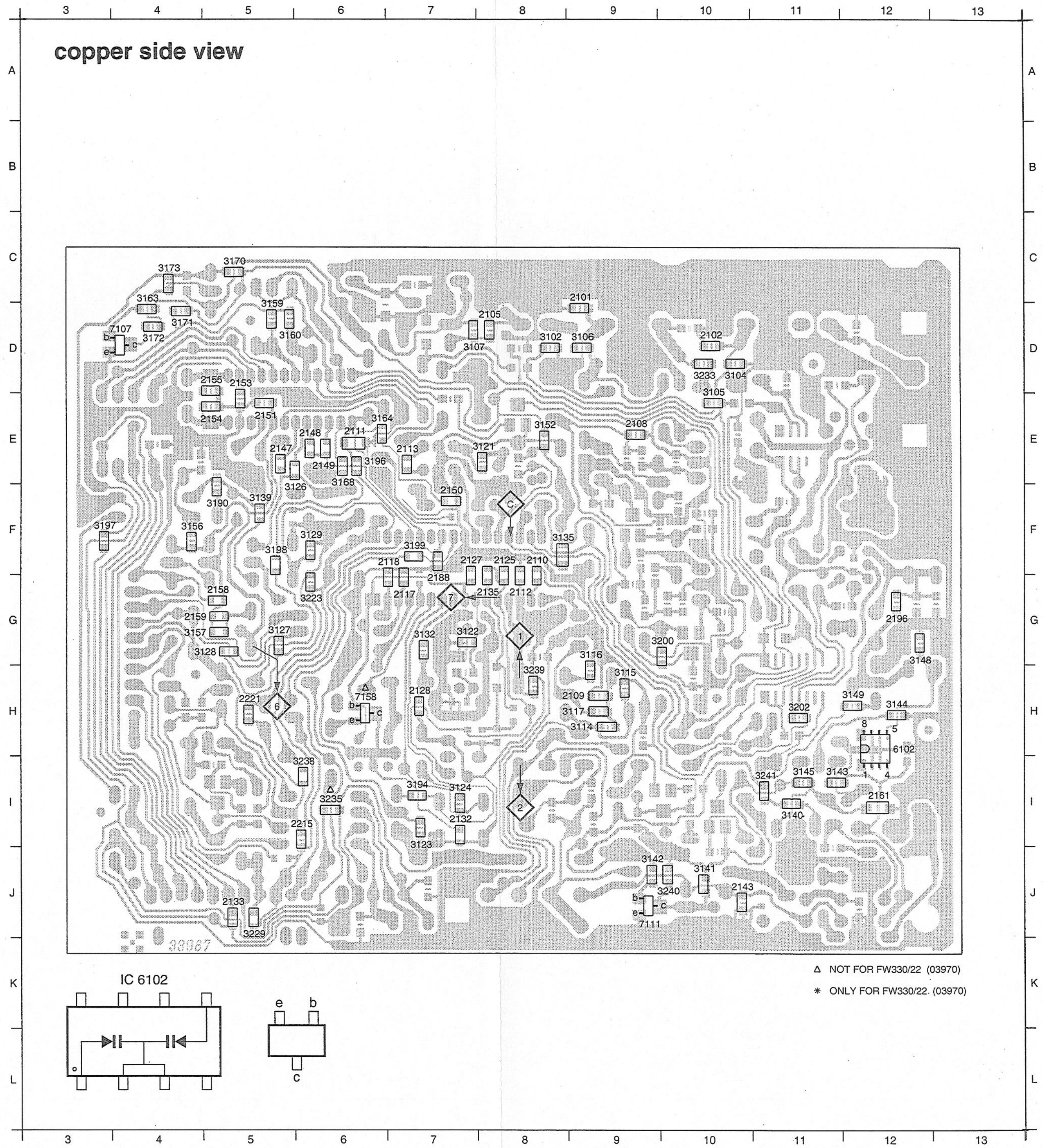
3171	D4	3196	E6	3202	H11	3238	I5	7107	D3
3172	D4	3197	F3	3223	G6	3239	H8	7111	J9
3173	C4	3198	F5	3229	J5	3240	J9	7158	H6
3190	F5	3199	F7	3233	D10	3241	I11		
3194	I7	3200	G9	3235	I6	6102	H12		


component side view
TUNER
1101
0004
1110
A
B
C
1
2
4
5
6
7
+12V
7105
7103
7106
7125
7108
7109
7112
7113
7114
7104
7110
7115
5104
5105
5106
5107
5108
5109
5113
5114
1117
1112
1149
2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I J K L

Δ NOT FOR FW330/22 (03970)

✱ ONLY FOR FW330/22 (03970)

TUNER MINI 94
3104 217 04270/03970 bl. 110 - 01 .7


copper side view
IC 6102
e b
c
3173
3170
3163
3171
7107
3172
3159
3160
2105
3107
2101
3102
3106
2102
3233
3104
3105
6102
7111
7158
3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I J K L

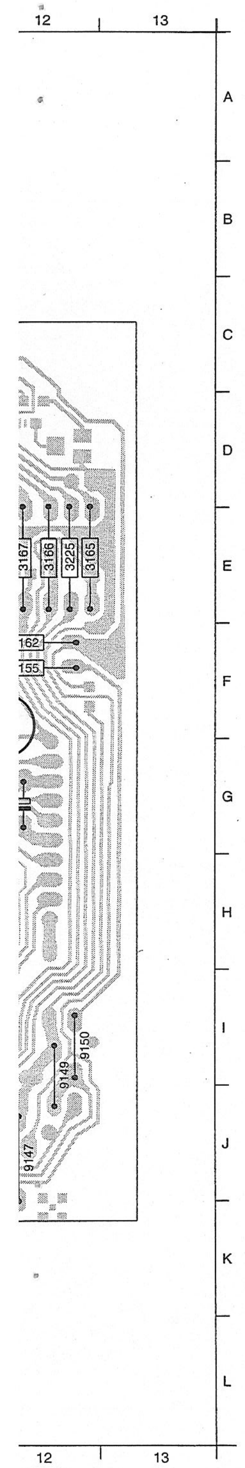
Δ NOT FOR FW330/22 (03970)

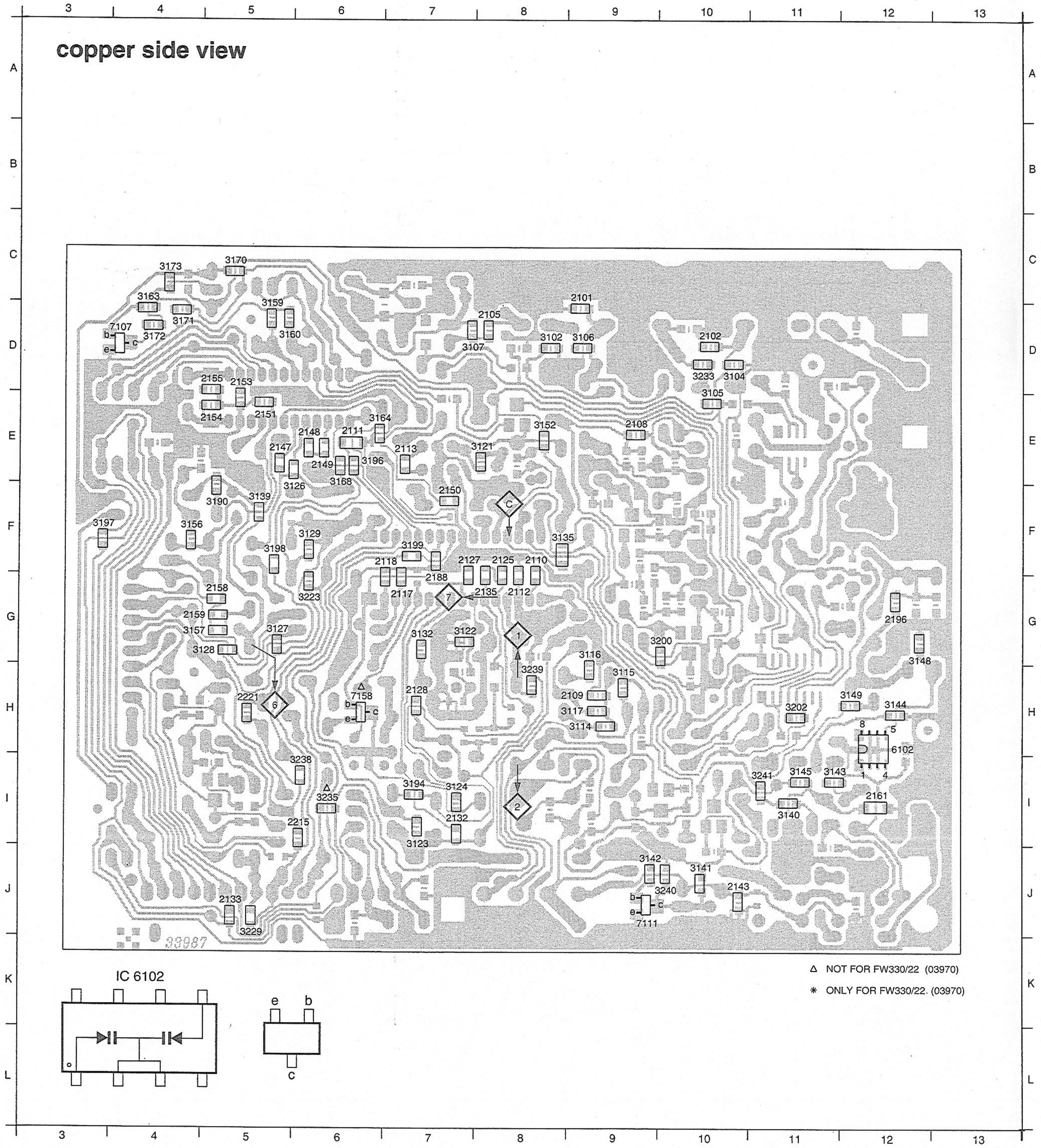
✱ ONLY FOR FW330/22 (03970)

H5	9119	I6
E6	9120	E7
H6	9122	G7
I6	9123	J7
H7	9124	G8
F7	9125	E9

2101	C9	2110	F8	2118	F6	2133	J5	2149	E6	2155	D4	2196	G12	3105	E10	3116	G9	3124	I7	3132	G7	3142	J9	3149	H12	3160	D5
2102	D10	2111	E6	2125	F8	2135	G7	2150	F7	2158	G5	2215	I5	3106	D9	3117	H8	3126	F5	3135	F8	3143	I11	3152	E8	3163	C4
2105	D8	2112	G8	2127	F7	2143	J10	2151	E5	2159	G4	2221	H5	3107	D7	3121	E7	3127	G5	3139	F5	3144	H12	3156	F4	3164	E6
2108	E9	2113	E7	2128	H7	2147	E5	2153	D5	2161	I12	3102	D8	3114	H9	3122	G7	3128	G4	3140	I11	3145	I11	3157	G4	3168	F6
2109	H8	2117	G7	2132	I7	2148	E6	2154	E4	2188	G7	3104	D10	3115	H9	3123	J7	3129	F6	3141	J10	3148	G12	3159	D5	3170	C5

3171	D4	3196	E6	3202	H11	3238	I5	7107	D3
3172	D4	3197	F3	3223	G6	3239	H8	7111	J9
3173	C4	3198	F5	3229	J5	3240	J9	7158	H6
3190	F5	3199	F7	3233	D10	3241	I11		
3194	I7	3200	G9	3235	I6	6102	H12		


12
13
A
B
C
D
E
F
G
H
I
J
K
L
3167
3166
3225
3165
3162
3155
9150
9149
9147

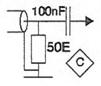

copper side view

3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
K
L
3173
3170
3163
3171
3172
7107
3159
3160
2105
3107
2101
3102
3106
2102
3233
3104
3105
2155
2153
2154
2151
3164
2148
2111
2147
2149
3196
2113
3126
3168
3121
3152
2108
3190
3139
2150
3197
3156
3129
3198
3199
2118
2188
2127
2125
2110
2117
2135
2112
3135
3223
2158
2159
3157
3128
3127
3132
3122
2196
3116
3239
3115
3200
3148
2221
7158
2128
2109
3117
3114
3202
3149
3144
6102
3238
3235
2215
3194
3124
2132
3123
3241
3145
3143
3140
2161
3142
3141
3240
2143
7111
2133
3229
33987
IC 6102
e
b
c

△ NOT FOR FW330/22 (03970)

∗ ONLY FOR FW330/22. (03970)

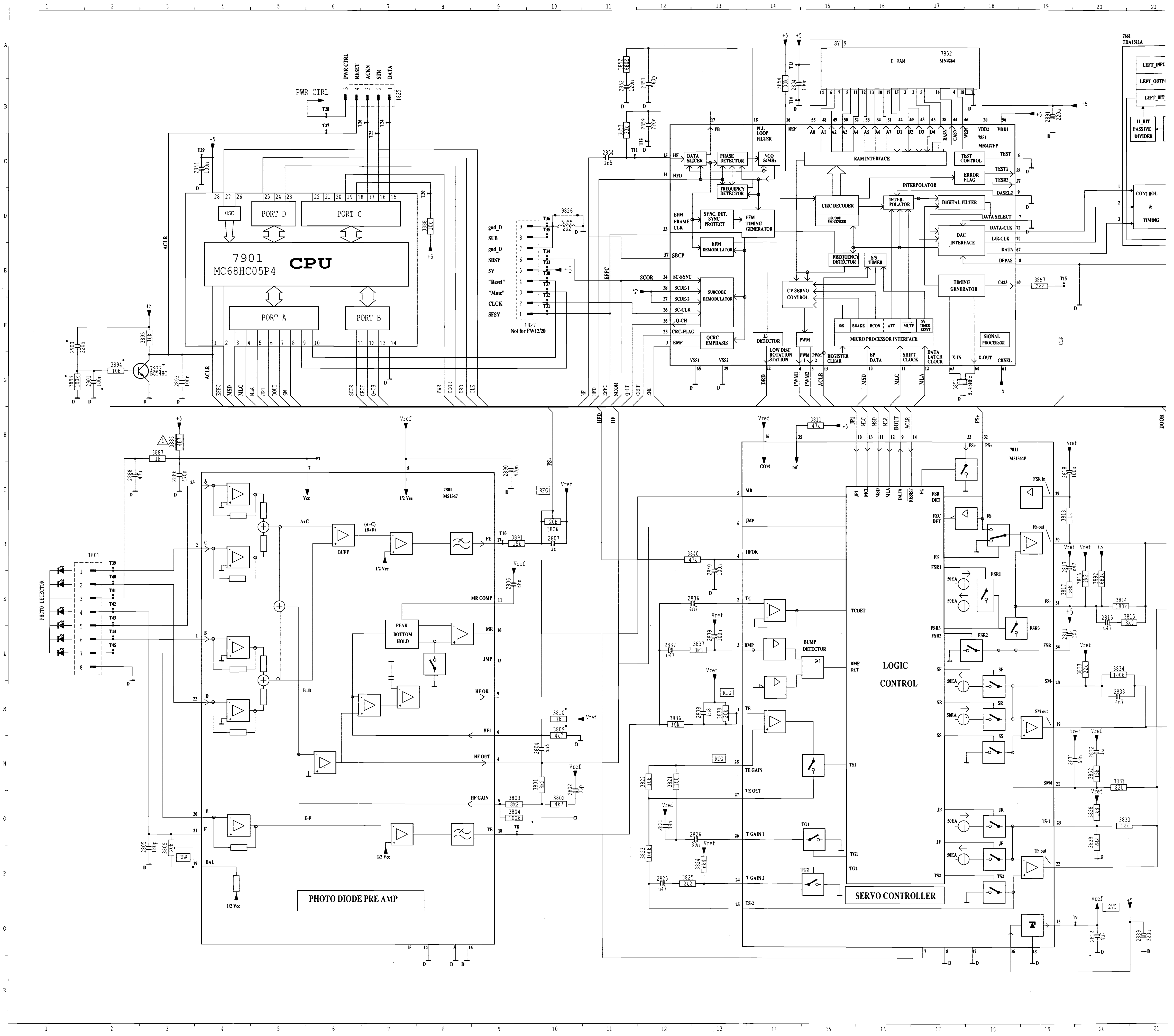
TUNER Adjustment Table (FM,MW,LW with Frame antenna)

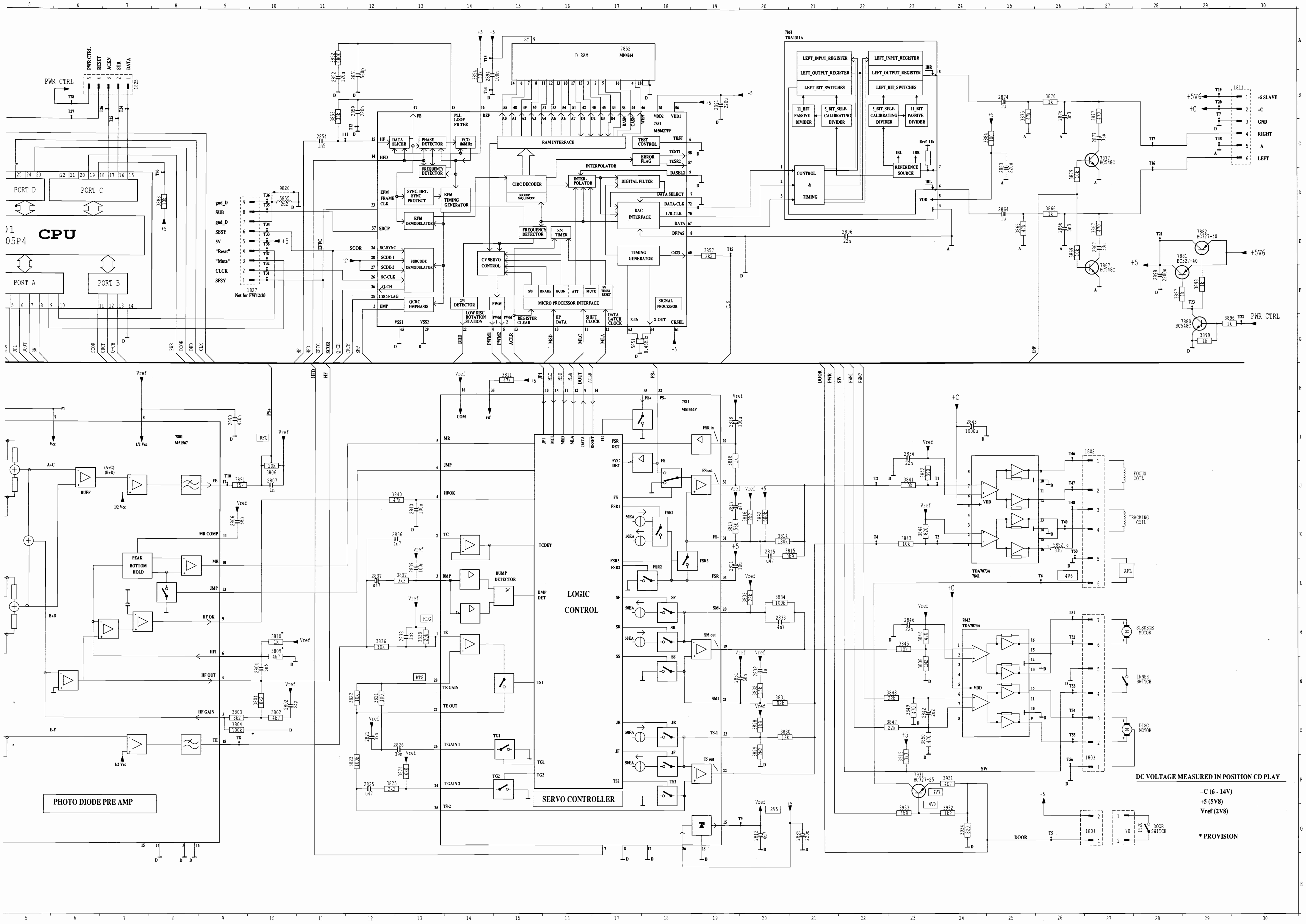
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50)			108 MHz	check	6	7.....9V
			87.5MHz	check		1.3.....2V
LW 153 - 279kHz (3)			279kHz	5108		8.5V ± 0.1V
			153kHz	check		0.7.... 1.5V
MW 522 - 1611kHz (9)			1611kHz	2142		8V ± 0.1V
			522kHz	check		0.7.....1.7V
FM IF						
FM	98 MHz 1mV mod = 1kHz Δf = 75kHz	A	98MHz	5105	1 2	0V ± 20mV
STEREO CROSSTALK						
FM	98 MHz 1mV 90% L + 9% pilot	A	98MHz	check	3	low < 1V
				3131	4	Right channel min.
SEARCH SENSITIVITY						
FM	98 MHz 12µV mod = 1kHz Δf = 75kHz	A	98MHz Sensitivity low "Level"	3125	5	Switches just from High to Low
AM - IF						
MW	1494kHz Δf = 10kHz low as posible swept signal		1494kHz	5104	7	symmetrical and max height
AM - RF						
LW	155kHz mod = 1kHz 30 % AM 270kHz	B *	155kHz	5109	7	MAX ↕
			270kHz	2140		
MW	558kHz mod = 1kHz 30 % AM 1494kHz		558kHz	5107		MAX ↕
			1494kHz	2141		

* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

CD CIRCUIT


7901
MC68HC05P4
CPU
OSC
PORT D
PORT C
PORT A
PORT B
PWR CTRL
RESET
ACKN
STR
DATA
1825
7932
BC548C
1827
Not for FW12/20
gnd_D
SUB
SBSY
5V
"Reset"
"Mute"
CLCK
SFSY
7852
D RAM
MN4264
7851
M50427FP
DATA SLICER
PHASE DETECTOR
VCO 8.46MHz
PLL LOOP FILTER
FREQUENCY DETECTOR
SYNC. DET. SYNC PROTECT
EFM TIMING GENERATOR
EFM DEMODULATOR
RAM INTERFACE
TEST CONTROL
ERROR FLAG
INTERPOLATOR
CIRC DECODER
INTER-POLATOR
DIGITAL FILTER
DAC INTERFACE
TIMING GENERATOR
SUBCODE DEMODULATOR
QCRC EMPHASIS
CV SERVO CONTROL
S/S TIMER
PWM
MICRO PROCESSOR INTERFACE
SIGNAL PROCESSOR
LOW DISC ROTATION STATION
REGISTER CLEAR
EP DATA
SHIFT CLOCK
DATA LATCH CLOCK
7861
TDA1311A
LEFT_INPUT
LEFT_OUTPUT
LEFT_BIT
11_BIT PASSIVE DIVIDER
CONTROL & TIMING
PHOTO DETECTOR
1801
7801
M51567
BUFF
PEAK BOTTOM HOLD
MR COMP
MR
JMP
HF OK
HFI
HF OUT
HF GAIN
TE
FE
1/2 Vcc
BAL
PHOTO DIODE PRE AMP
7811
M51564P
BUMP DETECTOR
LOGIC CONTROL
SERVO CONTROLLER
TE GAIN
TE OUT
T GAIN 1
T GAIN 2
TS-2
TG1
TG2
FSR
FS
SF
SR
SS
JR
JF
TS2
Vref
COM
ref


PWR CTRL
CPU
PORT A
PORT B
PORT C
PORT D
1827
Not for FW12/20
D RAM
7852
MN4264
7851
M50427FP
RAM INTERFACE
DATA SLICER
PHASE DETECTOR
VCO 8.6MHz
PLL LOOP FILTER
FREQUENCY DETECTOR
EFM FRAME CLK
SYNC. DET. SYNC PROTECT
EFM TIMING GENERATOR
EFM DEMODULATOR
CIRC DECODER
DECODE SEQUENCER
INTERPOLATOR
INTER-POLATOR
DIGITAL FILTER
DAC INTERFACE
TEST CONTROL
ERROR FLAG
FREQUENCY DETECTOR
S/S TIMER
SUBCODE DEMODULATOR
QCRC EMPHASIS
CV SERVO CONTROL
2/3 DETECTOR
LOW DISC ROTATION STATION
PWM
MICRO PROCESSOR INTERFACE
TIMING GENERATOR
SIGNAL PROCESSOR
REGISTER CLEAR
EP DATA
SHIFT CLOCK
DATA LATCH CLOCK
7861
TDA1311A
LEFT_INPUT_REGISTER
LEFT_OUTPUT_REGISTER
LEFT_BIT_SWITCHES
11_BIT PASSIVE DIVIDER
5_BIT_SELF-CALIBRATING DIVIDER
CONTROL & TIMING
REFERENCE SOURCE
Rref_11k
1811
+5 SLAVE
+C
GND
RIGHT
A
LEFT
7877 BC548C
7867 BC548C
7882 BC327-40
7881 BC327-40
7880 BC548C
+5V6
PWR CTRL
7801
M51567
BUFF
PEAK BOTTOM HOLD
PHOTO DIODE PRE AMP
7811
M51564P
LOGIC CONTROL
SERVO CONTROLLER
BUMP DETECTOR
TDA7073A
7841
7842
TDA7073A
1802
FOCUS COIL
TRACKING COIL
AFL
1803
SLEDGE MOTOR
INNER SWITCH
DISC MOTOR
7931
BC327-25
1804
DOOR
1920
DOOR SWITCH

DC VOLTAGE MEASURED IN POSITION CD PLAY

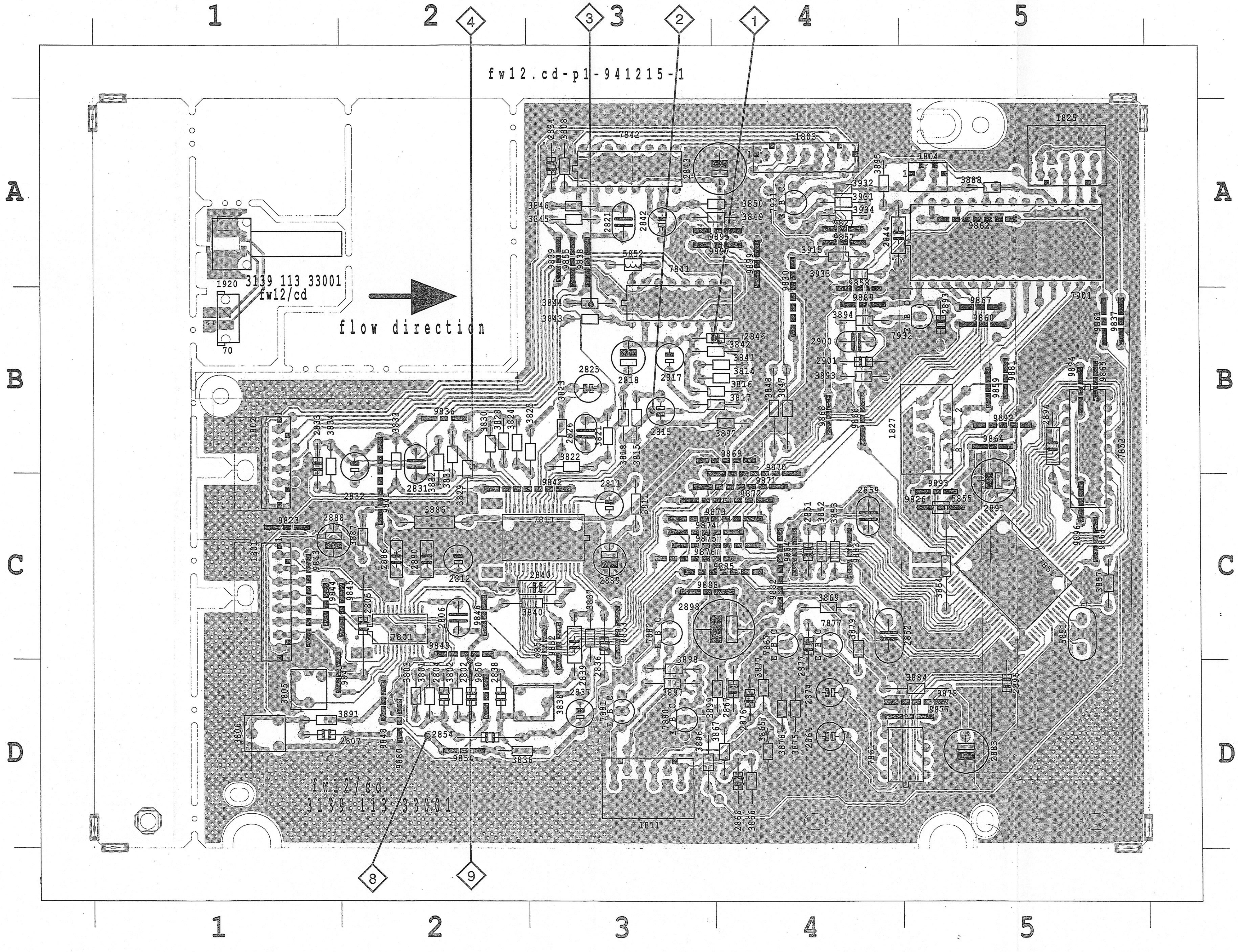
+C (6 - 14V)
+5 (5V8)
Vref (2V8)

* PROVISION

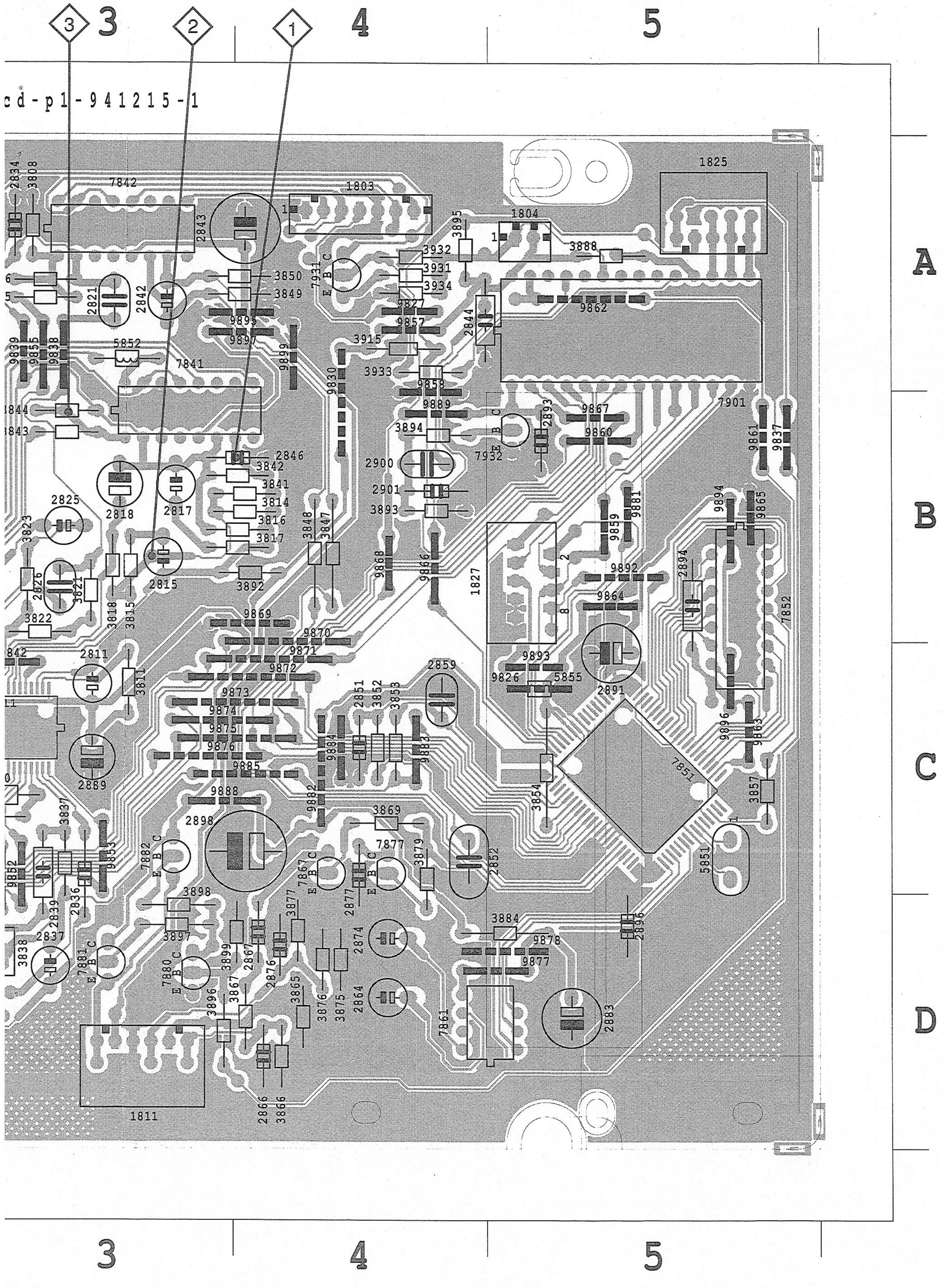
1801	J 2
1802	I27
1803	P27
1804	Q27
1811	B30
1825	B 7
1827	F10
1920	Q28
2802	N10
2804	N10
2805	P 3
2806	K 9
2807	J10
2811	L19
2812	Q20
2815	K20
2817	J19
2818	I19
2821	O12
2825	P12
2826	O13
2831	N19
2832	N20
2833	M20
2834	I23
2836	K13
2837	L12
2838	M13
2839	L13
2840	J13
2842	O23
2843	I24
2844	C 4
2846	M23
2851	B12
2852	B11
2854	C11
2859	B12
2864	D25
2866	E26
2867	E27
2874	B25
2876	B26
2877	C27
2883	C25
2886	I 3
2888	I 2
2889	Q21
2890	I 9
2891	B19
2893	G 3
2894	B14
2896	E22
2898	F28
2900	F 1
2901	G 2
3801	N10
3802	O10
3803	O 9
3804	O 9
3805	P 3
3806	J10
3808	N23
3809	M10
3810	M10
3811	H15
3814	K20
3815	K21
3816	K20
3817	K19
3818	I19
3821	N12
3822	N12
3823	P12
3824	P13
3825	P12
3828	O20
3829	O20
3830	O20
3831	N20
3832	N20
3833	L20
3834	L20
3836	M12
3837	L13
3838	M13
3840	J13
3841	J23
3842	J23
3843	K23
3844	K23
3845	M23
3846	M23
3847	O23
3848	N23
3849	O23
3850	O23
3852	A11
3853	B11
3854	B14
3857	E19
3865	E25
3866	D26
3867	E27
3869	E26
3875	B25
3876	B26
3877	B27
3879	D26
3884	C25
3886	H 3
3887	H 3
3888	D 8
3891	J 9
3892	K20
3893	G 1
3894	G 2
3895	F 3
3896	G29
3897	F28
3898	F29
3899	G29
3915	P23
3931	P24
3932	Q24
3933	Q23
3934	Q24
5851	G17
5852	K26
5855	D10
70	Q27
7801	I 8
7811	H18
7841	L24
7842	M24
7851	C18
7852	A17
7861	A20
7867	F27
7877	C27
7880	G29
7881	E28
7882	E29
7901	E 4
7931	P23
7932	G 3
9826	D10

CD LAYOUT

1827	B	5
1920	A	1
2802	D	2
2804	D	2
2805	C	2
2806	C	2
2807	D	1
2826	B	3
2831	B	2
2832	B	2
2833	B	1
2834	A	3
2836	C	3
2837	D	3
2851	C	4
2852	C	4
2854	D	2
2859	C	4
2864	D	4
2866	D	4
2867	D	4
2890	C	2
2891	C	5
2893	B	5
2894	B	5
2896	D	5
2898	C	4
2900	B	4
3811	C	3
3814	B	4
3815	B	3
3816	B	4
3817	B	4
3818	B	3
3821	B	3
3831	B	2
3832	B	2
3833	B	2
3834	B	1
3836	D	2
3837	C	3
3838	D	3
3847	B	4
3848	B	4
3849	A	4
3850	A	4
3852	C	4
3853	C	4
3854	C	5
3877	D	4
3879	C	4
3884	D	5
3886	C	2
3887	C	2
3888	A	5
3891	D	1
3899	D	4
3915	A	4
3931	A	4
3932	A	4
3933	A	4
3934	A	4
5851	C	5
7852	B	5
7861	D	5
7867	C	4
7877	C	4
7880	D	3
7881	D	3
7882	C	3
9836	B	2
9837	B	5
9838	A	3
9839	A	3
9841	C	2
9842	C	2
9843	C	1
9851	C	3
9852	C	3
9853	C	3
9854	D	2
9855	A	3
9857	A	4
9858	B	4
9866	B	4
9867	B	5
9868	B	4
9869	B	4
9870	C	4
9871	C	4
9872	C	4
9881	B	5
9882	C	4
9883	C	4
9884	C	4
9885	C	4
9888	C	3
9889	B	4


1
2
3
4
5
A
B
C
D
④
③
②
①
⑧
⑨
fw12.cd-p1-941215-1
3139 113 33001
fw12/cd
flow direction
1920
1802
1801
1803
1804
1825
1827
1811
7842
7841
7811
7801
7901
7851
7852
7861
5852
5855
5851
3805
3806
3886
2888
2812
2811
2889
2898
2891
2883
2852
2859
2818
2817
2815
2825
2826
2821
2842
2843
2832
2831
2806
2837

3877	D	4
3879	C	4
3884	D	5
3886	C	2
3887	C	2
3888	A	5
3891	D	1
3899	D	4
3915	A	4
3931	A	4
3932	A	4
3933	A	4
3934	A	4
5851	C	5
7852	B	5
7861	D	5
7867	C	4
7877	C	4
7880	D	3
7881	D	3
7882	C	3
9836	B	2
9837	B	5
9838	A	3
9839	A	3
9841	C	2
9842	C	2
9843	C	1
9851	C	3
9852	C	3
9853	C	3
9854	D	2
9855	A	3
9857	A	4
9858	B	4
9866	B	4
9867	B	5
9868	B	4
9869	B	4
9870	C	4
9871	C	4
9872	C	4
9881	B	5
9882	C	4
9883	C	4
9884	C	4
9885	C	4
9888	C	3
9889	B	4



3
2
1
3
4
5
cd-p1-941215-1
1803
1804
1825
7842
7841
7901
7932
7931
7851
7852
7861
7877
1827
1811
5852
5855
5851
2843
2844
2846
2859
2891
2898
2900
2901
3850
3849
3888
3895
3915
3932
3931
3934
3933
3894
3893
3842
3841
3814
3816
3817
3892
3869
3884
9862
9867
9860
9889
9893
9826
9892
9864
2825
2818
2817
2815
2811
2869
2883
2852
A
B
C
D
3
4
5

CD ADJUSTMENT TABLE

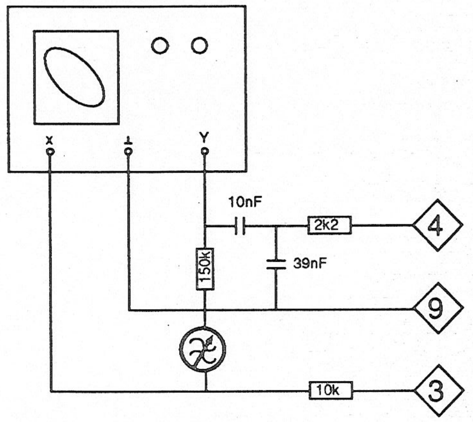
CD-PART	⊛	◇	↻	▭	▯
LASER CURRENT					
The APC (Automatic Power Control) for the laser diode is located on the disc drive and has been adjusted in the production line. Therefore for service purpose it is not intended to adjust the laser current.					
TRACKING BALANCE					
Service pos. 2 * Display shows RDL 2"		◇8 ◇9	3805	Adjust to 0V DC Offset	
TRACKING GAIN					
Play with Test Disc 5 **	1200 Hz 100 mVrms	see Fig. 1	3838		CHX = 50 mV/DIV CHY = 50 mV/DIV (AC-COUPLED) Adjust according to Fig. 3
FOCUS GAIN					
Play with Test Disc 5	1200 Hz 500 mVrms	see Fig. 2	3806		CHX = 200 mV/DIV CHY = 200 mV/DIV (AC-COUPLED) Adjust according to Fig. 3

Test disc 5 4822 397 30096

* See CD Service mode

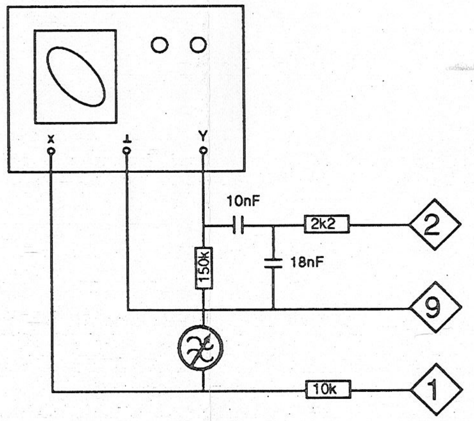
* * 2839 must be shorted during adjustment.

Fig. 1



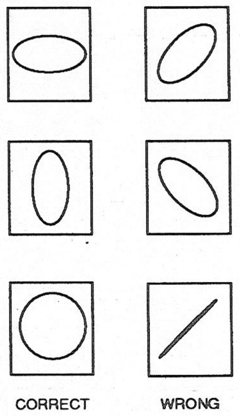
X
⊥
Y
10nF
2k2
4
150k
39nF
9
10k
3

Fig. 2



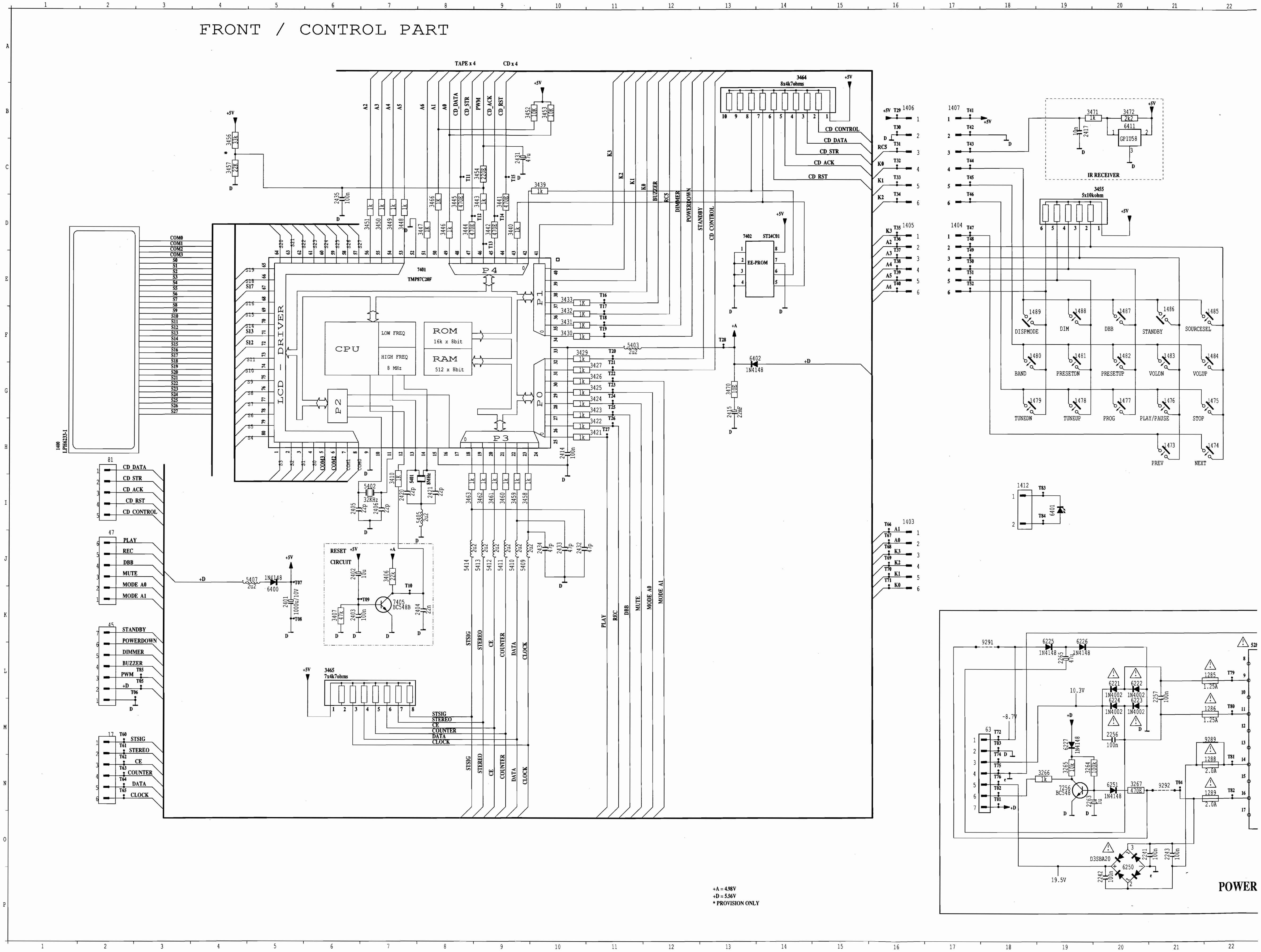
X
⊥
Y
10nF
2k2
2
150k
18nF
9
10k
1

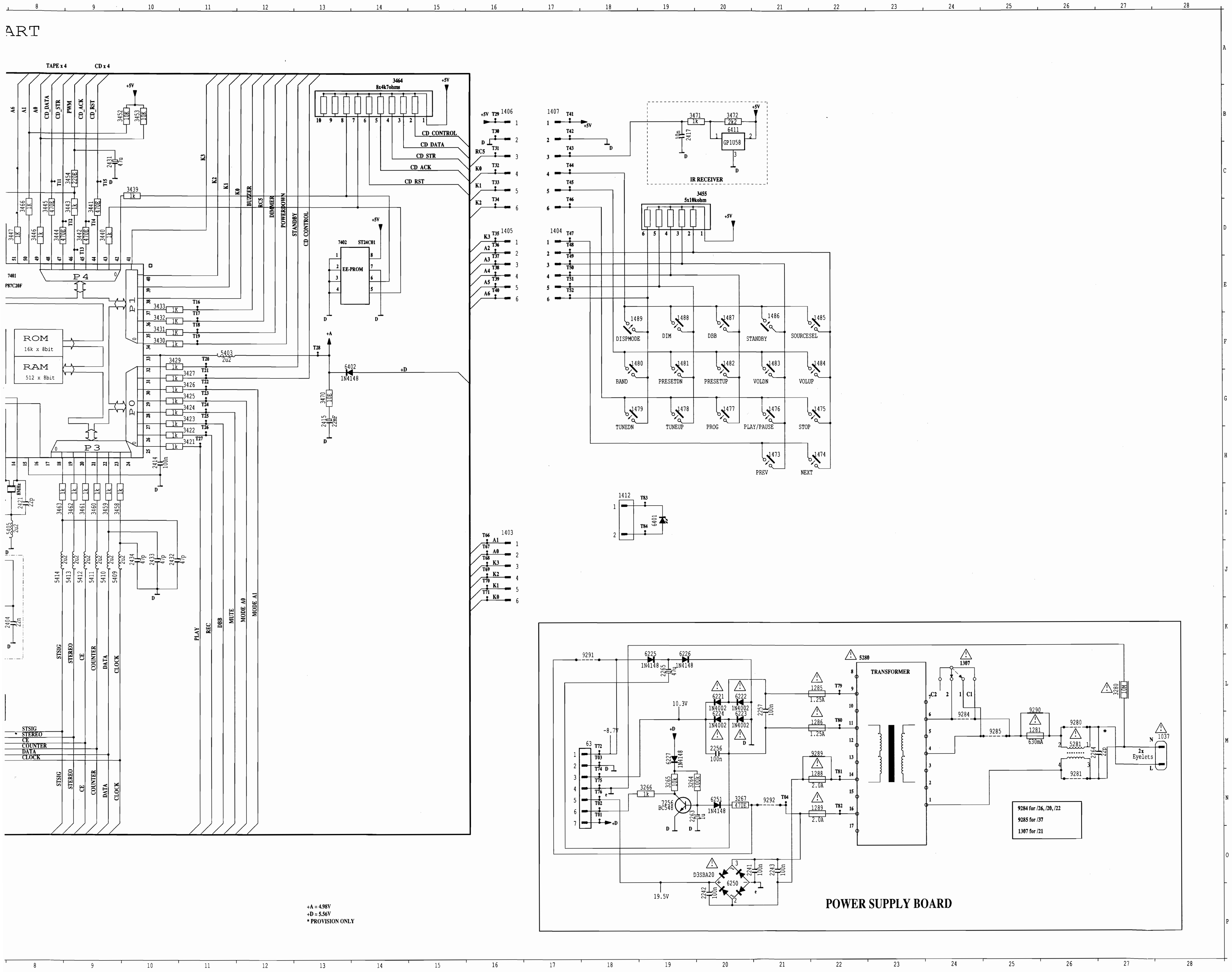
Fig. 3



CORRECT
WRONG

FRONT CIRCUIT

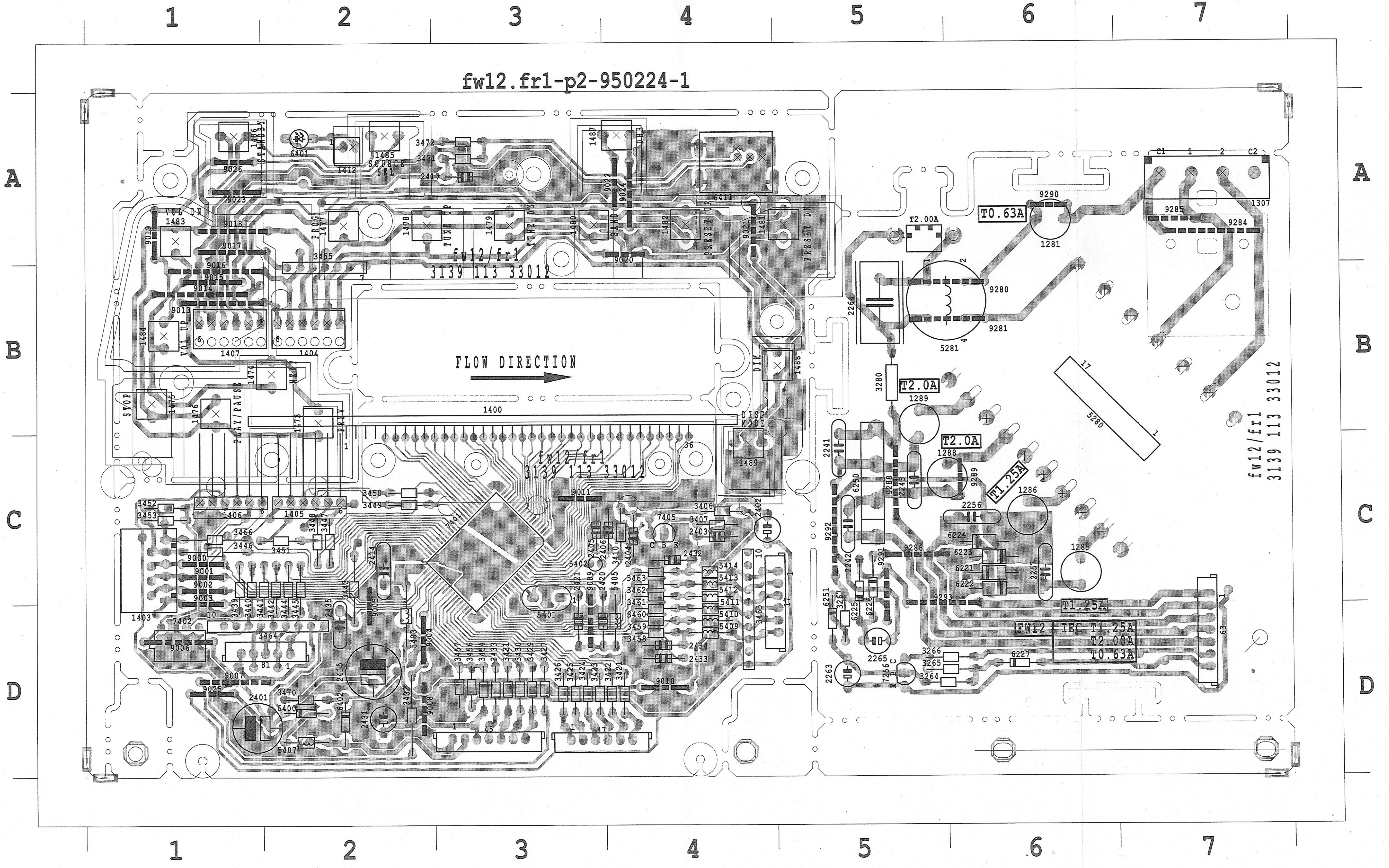

FRONT / CONTROL PART
TAPE x 4
CD x 4
7401
TMP87C20F
CPU
LOW FREQ
HIGH FREQ
8 MHz
ROM
16k x 8bit
RAM
512 x 8bit
LCD - DRIVER
P0
P1
P2
P3
P4
1400
LPH6233-1
3464
8x4k7ohms
3465
7x4k7ohms
3455
5x10kohm
7402
ST24C01
EE-PROM
IR RECEIVER
GP1U58
6411
RESET
CIRCUIT
7405
BC548B
5402
32KHz
5401
8MHz
6400
1N4148
6402
1N4148
CD DATA
CD STR
CD ACK
CD RST
CD CONTROL
PLAY
REC
DBB
MUTE
MODE A0
MODE A1
STANDBY
POWERDOWN
DIMMER
BUZZER
PWM
STSIG
STEREO
CE
COUNTER
DATA
CLOCK
DISPMODE
DIM
DBB
STANDBY
SOURCESEL
BAND
PRESETDN
PRESETUP
VOLDN
VOLUP
TUNEDN
TUNEUP
PROG
PLAY/PAUSE
STOP
PREV
NEXT
1406
1407
1405
1404
1403
1412
6401
81
47
45
17
63
7256
BC548
D3SBA20
6250
6225
6226
6221
6222
6223
6224
1N4002
1285
1286
1288
1289
1.25A
2.0A
10.3V
-8.7V
19.5V
POWER
+A = 4.98V
+D = 5.56V
* PROVISION ONLY


ART
TAPE x 4
CD x 4
7401
P87C20F
P4
P1
P0
P3
ROM
16k x 8bit
RAM
512 x 8bit
A6
A1
A0
CD_DATA
CD_STR
PWM
CD_ACK
CD_RST
K3
K2
K1
K0
BUZZER
RC5
DIMMER
POWERDOWN
STANDBY
CD CONTROL
3464
8x4k7ohms
+5V
CD_CONTROL
CD DATA
CD STR
CD ACK
CD RST
7402
ST24C01
EE-PROM
6402
1N4148
+D
+A
T28
5403
2u2
3470
10E
2415
22uF
2414
100n
8MHz
STSIG
STEREO
CE
COUNTER
DATA
CLOCK
PLAY
REC
DBB
MUTE
MODE A0
MODE A1
1406
1405
1403
1407
1404
RC5
IR RECEIVER
3471
1K
3472
2K2
6411
GP1U58
2417
10n
3455
5x10kohm
1489
DISPMODE
1488
DIM
1487
DBB
1486
STANDBY
1485
SOURCESEL
1480
BAND
1481
PRESETDN
1482
PRESETUP
1483
VOLDN
1484
VOLUP
1479
TUNEDN
1478
TUNEUP
1477
PROG
1476
PLAY/PAUSE
1475
STOP
1473
PREV
1474
NEXT
1412
T83
T84
6401
+A = 4.98V
+D = 5.56V
* PROVISION ONLY
9291
6225
1N4148
6226
1N4148
2265
47u
6221
1N4002
6222
1N4002
6224
1N4002
6223
1N4002
10.3V
-8.7V
2257
100n
2256
100n
6227
1N4148
3265
10K
3264
100K
3266
1K
7256
BC548
2263
1u
6251
1N4148
3267
470E
9292
T04
5280
TRANSFORMER
1285
1.25A
1286
1.25A
1288
2.0A
1289
2.0A
9289
1307
C2
C1
9284
9285
9290
1281
630mA
9280
5281
9281
2264
3280
10M
1037
2x
Eyelets
N
L
D3SBA20
6250
2241
100n
2243
100n
2242
100n
19.5V
9284 for /26, /20, /22
9285 for /37
1307 for /21
POWER SUPPLY BOARD

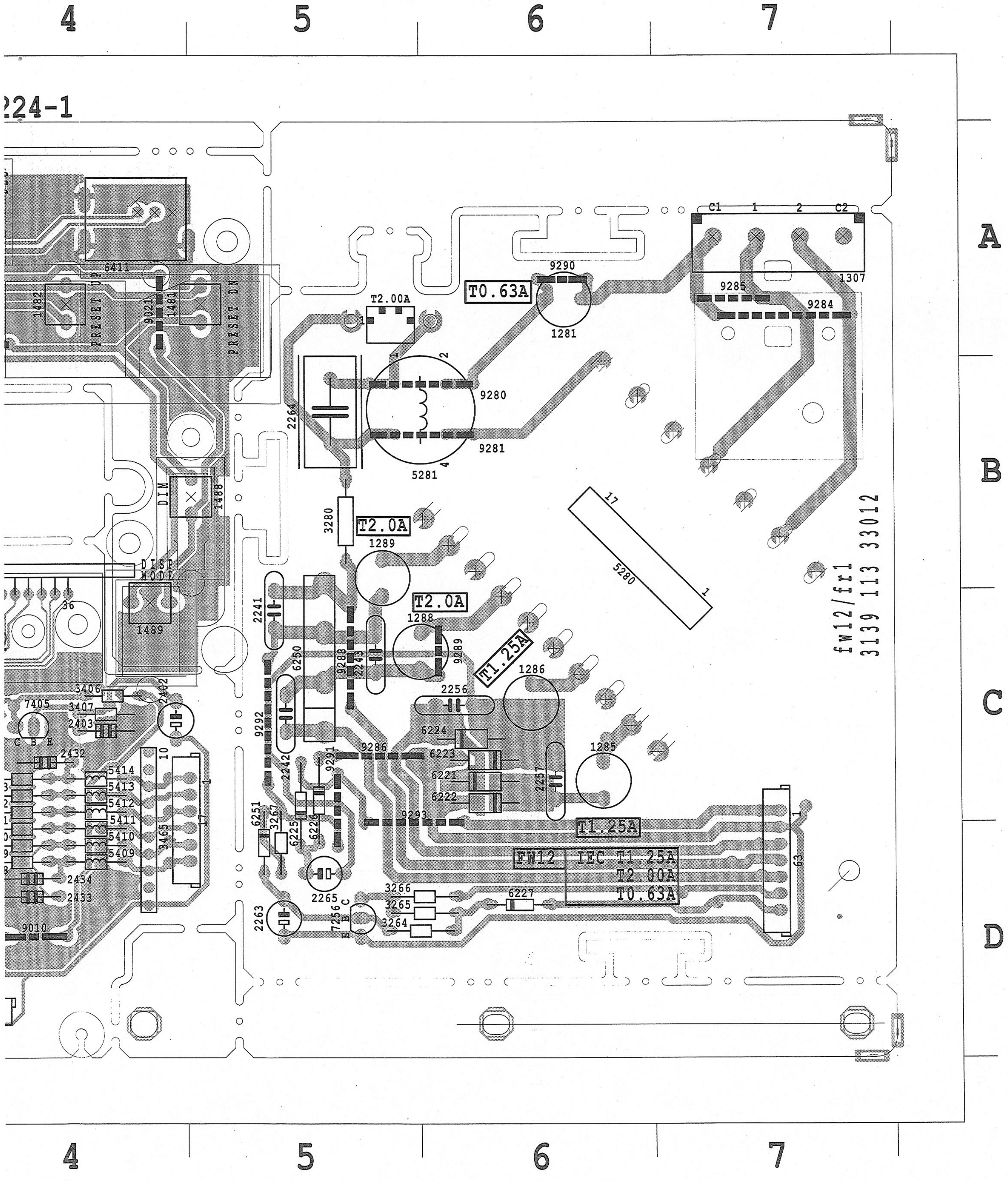
1011	H 2
1012	I18
1013	J 2
1015	K 2
1017	M 2
1037	M28
1063	M18
1281	M25
1285	L22
1286	M22
1288	N22
1289	N22
1307	L24
1400	H 1
1403	I16
1404	D17
1405	D16
1406	B16
1407	B17
1473	H21
1474	H22
1475	G22
1476	G21
1477	G20
1478	G19
1479	G18
1480	F18
1481	F19
1482	F20
1483	F21
1484	F22
1485	F22
1486	E21
1487	F20
1488	F19
1489	F18
2241	O20
2242	P20
2243	O21
2256	M20
2257	L21
2263	N19
2264	M26
2265	L19
2401	K 5
2402	J 6
2403	K 6
2404	K 8
2405	I 6
2406	I 7
2414	H10
2415	G13
2417	B19
2420	I 7
2421	I 8
2431	C 9
2432	J10
2433	J10
2434	J10
2435	D 6
3264	N19
3265	N19
3266	N19
3267	N20
3280	L27
3406	J 7
3407	K 6
3410	I 7
3421	H11
3422	H11
3423	G11
3424	G11
3425	G11
3426	G11
3427	G11
3429	F10
3430	F10
3431	F10
3432	F10
3433	E10
3439	C10
3440	D 9
3441	D 9
3442	D 9
3443	D 9
3444	D 8
3445	D 8
3446	D 8
3447	D 8
3448	D 7
3449	D 7
3450	D 7
3451	D 7
3452	B 9
3453	B10
3454	C 9
3455	C20
3456	C 4
3457	C 4
3458	I 9
3459	I 9
3460	I 9
3461	I 9
3462	I 9
3463	I 8
3464	A15
3465	L 6
3466	D 8
3470	G13
3471	B20
3472	B20
5281	M26
5401	I 7
5402	I 7
5403	F11
5405	I 8
5407	J 5
5409	J 9
5410	J 9
5411	J 9
5412	J 9
5413	J 9
5414	J 8
6221	L20
6222	L20
6223	M20
6224	M20
6225	L19
6226	L19
6227	M19
6250	P20
6251	N20
6400	J 5
6401	I19
6402	F13
6411	B20
7256	N19
7401	E 7
7402	D13
7405	K 7
9280	M26
9281	N26
9284	M24
9285	M25
9289	M22
9290	M25
9291	L18
9292	N21

FRONT LAYOUT

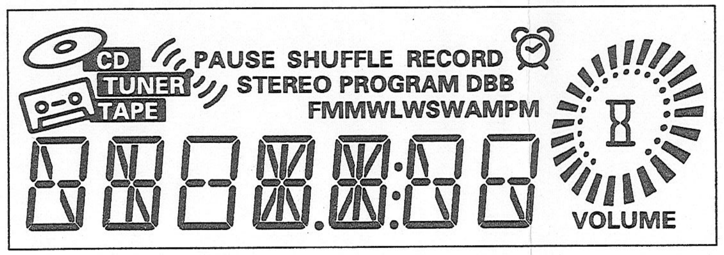
63	D	7
81	D	2
1037	A	5
1281	A	6
1285	C	6
1286	C	6
1288	C	6
1403	C	1
1404	B	2
1405	C	2
1406	C	1
1407	B	1
1412	A	2
1473	B	2
1477	A	2
1478	A	2
1479	A	3
1480	A	3
1481	A	5
1482	A	4
1483	A	1
1487	A	4
1488	B	5
1489	C	4
2241	C	5
2242	C	5
2243	C	5
2256	C	6
2265	D	5
2401	D	1
2402	C	4
2403	C	4
2404	C	4
2405	C	3
2406	C	4
2420	D	3
2421	D	3
2431	D	2
2432	C	4
2433	D	4
2434	D	4
2435	D	2
3267	D	5
3280	B	5
3406	C	4
3407	C	4
3410	C	4
3421	D	4
3422	D	4
3426	D	3
3427	D	3
3429	D	3
3430	D	3
3431	D	3
3432	D	2
3433	D	3
3442	C	2
3443	C	2
3444	C	2
3445	C	2
3446	C	1
3447	C	2
3448	C	2
3452	C	1
3453	C	1
3454	D	3
3455	B	2
3456	D	3
3457	D	3
3458	D	4
3462	C	4
3463	C	4
3464	D	2
3465	D	4
3466	C	1
3470	D	2
3471	A	3
5401	C	3
5402	C	3
5403	D	2
5405	D	4
5407	D	2
5409	D	4
5410	D	4
5414	C	4
6221	C	6
6222	C	6
6223	C	6
6224	C	6
6225	C	5
6226	C	5
6400	D	2
6401	A	2
6402	D	2
6411	A	4
7256	D	5
7402	D	1
7405	C	4
9003	C	1
9004	D	2
9005	D	2
9006	D	1
9007	D	1
9008	D	2
9009	D	3
9014	B	1
9015	B	1
9016	B	1
9017	A	1
9018	A	1
9019	A	1
9020	A	4
9024	A	4
9025	D	1
9026	A	1
9280	B	6
9281	B	6
9284	A	7
9285	A	7
9290	A	6
9291	C	5
9292	C	5
9293	D	5


1
2
3
4
5
6
7
A
B
C
D
fw12.fr1-p2-950224-1
STANDBY
SOURCE SEL
PROG
TUNE UP
TUNE DN
BAND
PRESET UP
PRESET DN
OBB
VOL DN
VOL UP
NEXT
STOP
PLAY/PAUSE
PREV
DIM
DISP MODE
FLOW DIRECTION
fw12/fr1
3139 113 33012
1400
T0.63A
T2.00A
T2.0A
T1.25A
FW12 IEC T1.25A
T2.00A
T0.63A
1307
5281
5280
63

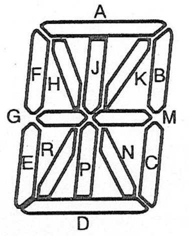
3452	C 1	3462	C 4	5401	C 3	5414	C 4	6400	D 2	9003	C 1	9014	B 1	9024	A 4	9290	A 6
3453	C 1	3463	C 4	5402	C 3	6221	C 6	6401	A 2	9004	D 2	9015	B 1	9025	D 1	9291	C 5
3454	D 3	3464	D 2	5403	D 2	6222	C 6	6402	D 2	9005	D 2	9016	B 1	9026	A 1	9292	C 5
3455	B 2	3465	D 4	5405	D 4	6223	C 6	6411	A 4	9006	D 1	9017	A 1	9280	B 6	9293	D 5
3456	D 3	3466	C 1	5407	D 2	6224	C 6	7256	D 5	9007	D 1	9018	A 1	9281	B 6		
3457	D 3	3470	D 2	5409	D 4	6225	C 5	7402	D 1	9008	D 2	9019	A 1	9284	A 7		
3458	D 4	3471	A 3	5410	D 4	6226	C 5	7405	C 4	9009	D 3	9020	A 4	9285	A 7		

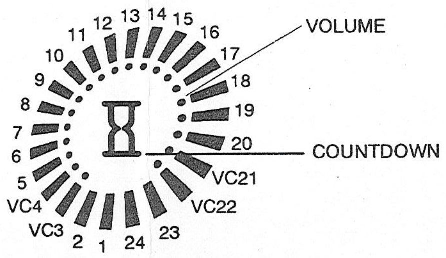

4
5
6
7
224-1
A
B
C
D
6411
1482
PRESET UP
9021
1481
PRESET DN
T2.00A
T0.63A
9290
1281
C1
1
2
C2
1307
9285
9284
2264
9280
9281
5281
DIM
1488
3280
T2.0A
1289
17
5280
1
fw12/fr1
3139 113 33012
DISP MODE
1489
36
2241
6250
9288
2243
9289
T2.0A
1288
T1.25A
1286
2256
3406
7405
3407
2403
2402
C B E
2432
5414
5413
5412
5411
5410
5409
2434
2433
9010
3465
10
17
9292
2242
9291
9286
6224
6223
6221
6222
2257
1285
9293
T1.25A
FW12
IEC T1.25A
T2.00A
T0.63A
6251
3267
6225
6226
2265
2263
7256
E B C
3266
3265
3264
6227
63

LCD PINS CONNECTION TABLE


CD
TUNER
TAPE
PAUSE SHUFFLE RECORD
STEREO PROGRAM DBB
FMMWLWSWAMPM
VOLUME

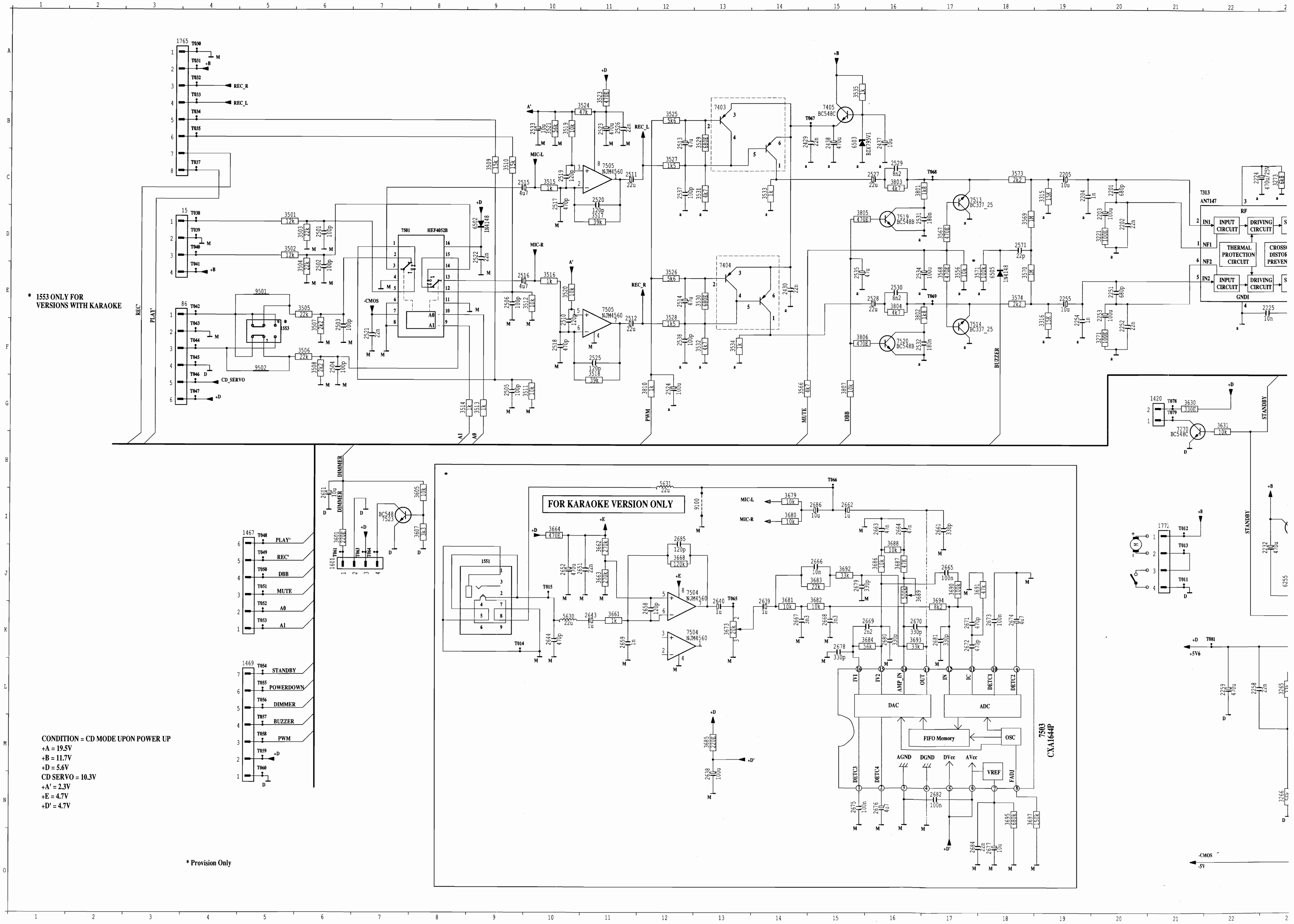
LCD pins connections


A
F
H
J
K
B
G
M
E
R
P
N
C
D


11
12
13
14
15
16
17
18
19
20
VC21
VC22
23
24
1
2
VC3
VC4
5
6
7
8
9
10
VOLUME
COUNTDOWN

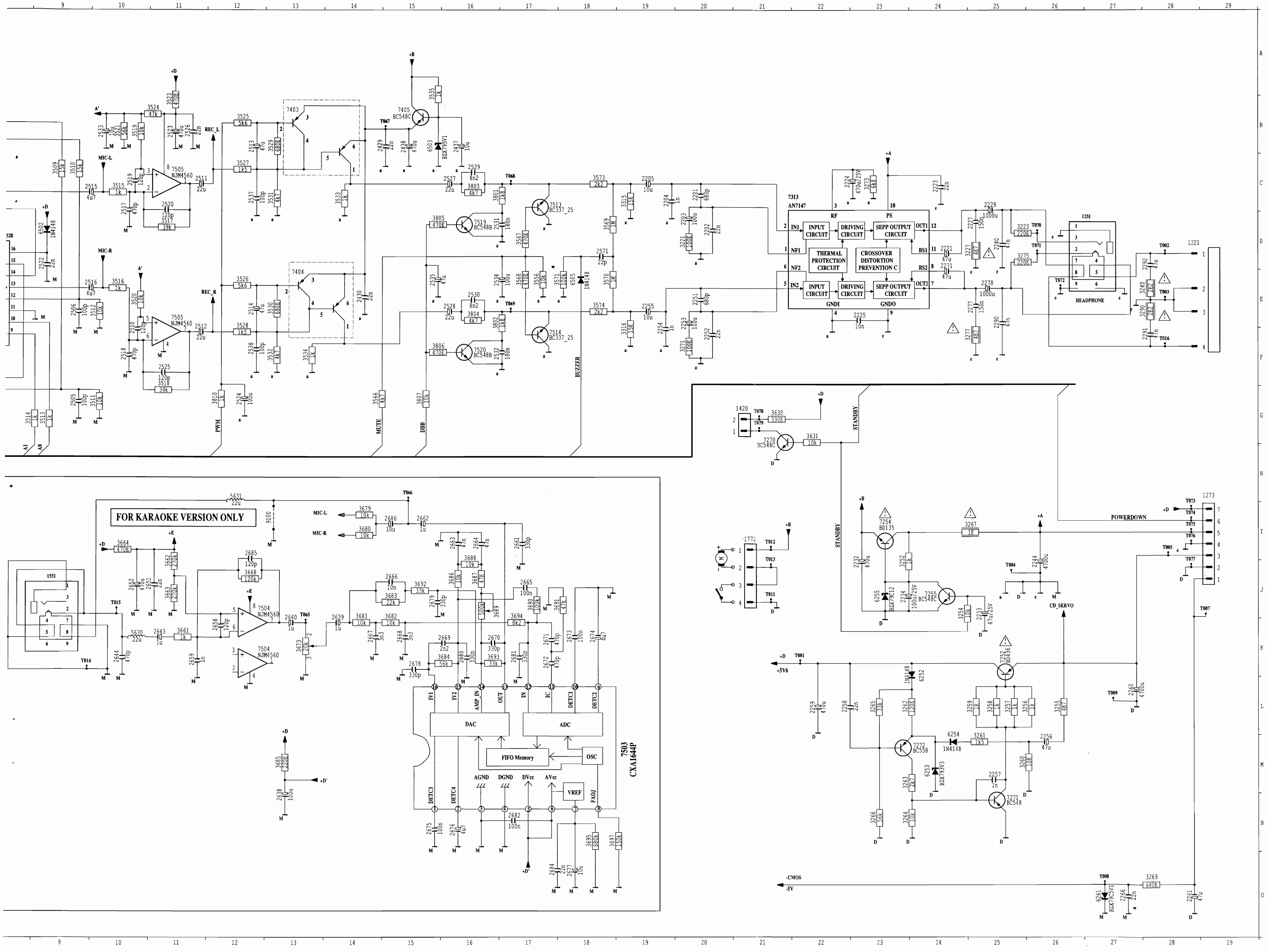
PIN NO	COM 0 (PIN1)	COM 1 (PIN2)	COM 2 (PIN3)	COM 3 (PIN4)
5	6F	6GM	6E	6D
6	3H	6H	6N	CD
7	6A	6B	6C	**TUNER**
8	5F	5G	5E	5D
9	**TAPE**	5JP	5M	5HN
10	5A	5B	5C	**PAUSE**
11	4F	4GM	4E	4D
12	4A	4B	4C	**STEREO**
13	3F	3G	3E	3D
14	3A	3K	3JP	3R
15	3B	3M	3C	3N
16	2F	2G	2E	2D
17	2A	2K	2JP	2R
18	2B	2M	2C	2N
19	**LW**	2H	COL	**SW**,P2
20	1F	1GM	1E	1D
21	**MW**	1H	1N	**FM**,P1
22	1A	1B	1C	**PROGRAM**
23	0F	0GM	0E	0D
24	0A	0B	0C	0N
25	VC5	VC6	VC7	VC8
26	VC4	VC3	VC2	VC1
27	**AM**	**PM**	COUNTDOWN	VOLUME
28	VC21	VC22	VC23	VC24
29	VC20	VC19	VC18	VC17
30	VC13	VC14	VC15	VC16
31	VC12	VC11	VC10	VC9
32	**RECORD**	**DBB**	**ALARM**	**SHUFFLE**

COMBI CIRCUIT I

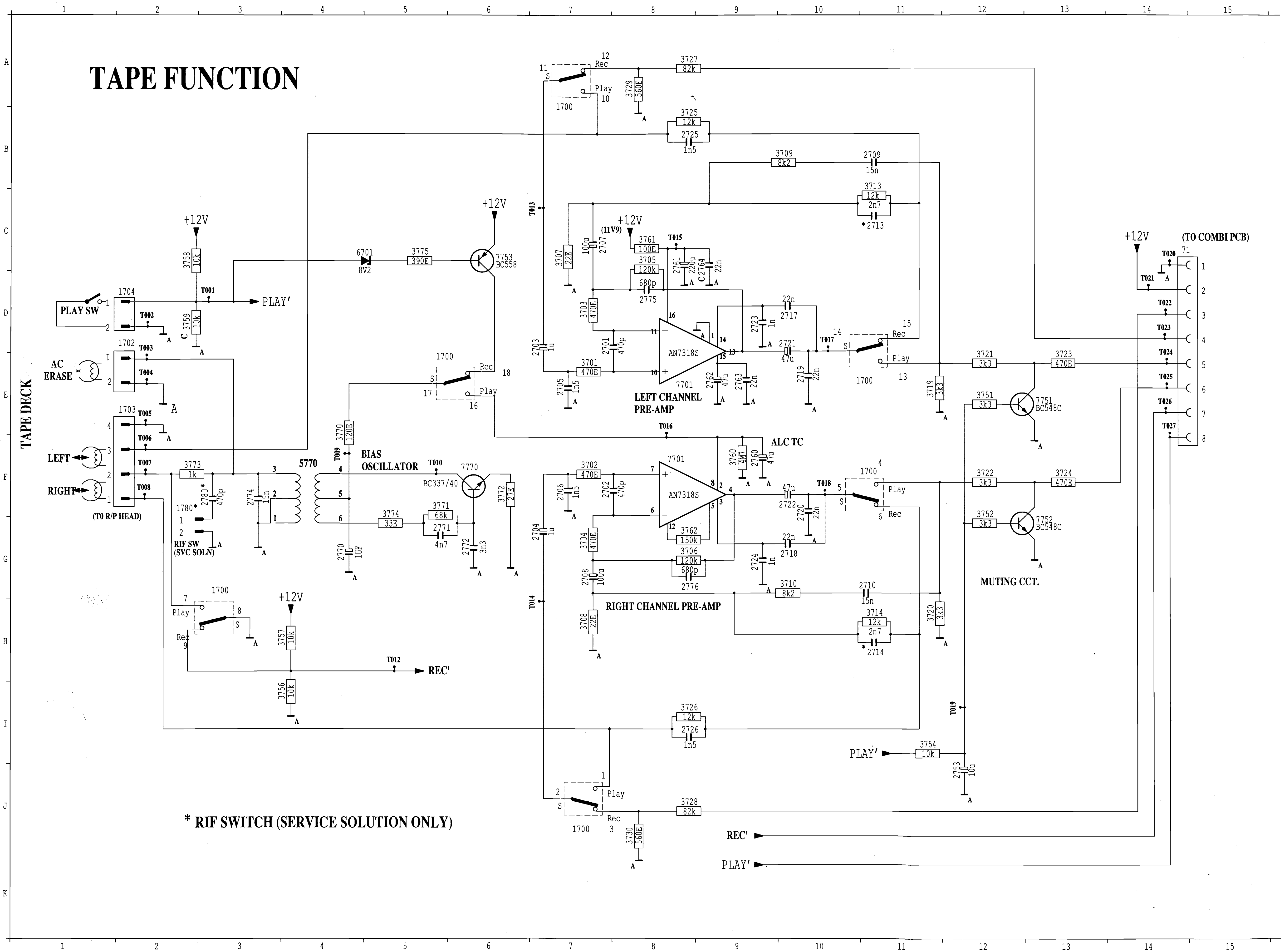


* 1553 ONLY FOR VERSIONS WITH KARAOKE
FOR KARAOKE VERSION ONLY
* Provision Only
1765
15
86
1467
1469
1601
1420
1772
1551
1553
7501 HEF4052B
7505 NJM4560
7504 NJM4560
7403
7404
7405 BC548C
7513 BC337_25
7514 BC337_25
7519 BC548B
7520 BC548B
7523 BC548
7270 BC548C
7313 AN7147
7503 CXA1644P
6502 1N4148
6505 1N4148
6503 BZX79C11
REC_R
REC_L
REC'
PLAY'
CD_SERVO
MIC-L
MIC-R
PWM
MUTE
DBB
BUZZER
DIMMER
STANDBY
POWERDOWN
A0
A1
-CMOS
INPUT CIRCUIT
DRIVING CIRCUIT
THERMAL PROTECTION CIRCUIT
GNDI
DAC
ADC
FIFO Memory
OSC
VREF
IV1
IV2
AMP IN
OUT
IN
IC
DETC1
DETC2
DETC3
DETC4
AGND
DGND
DVcc
AVcc
FADJ
+5V6
-5V

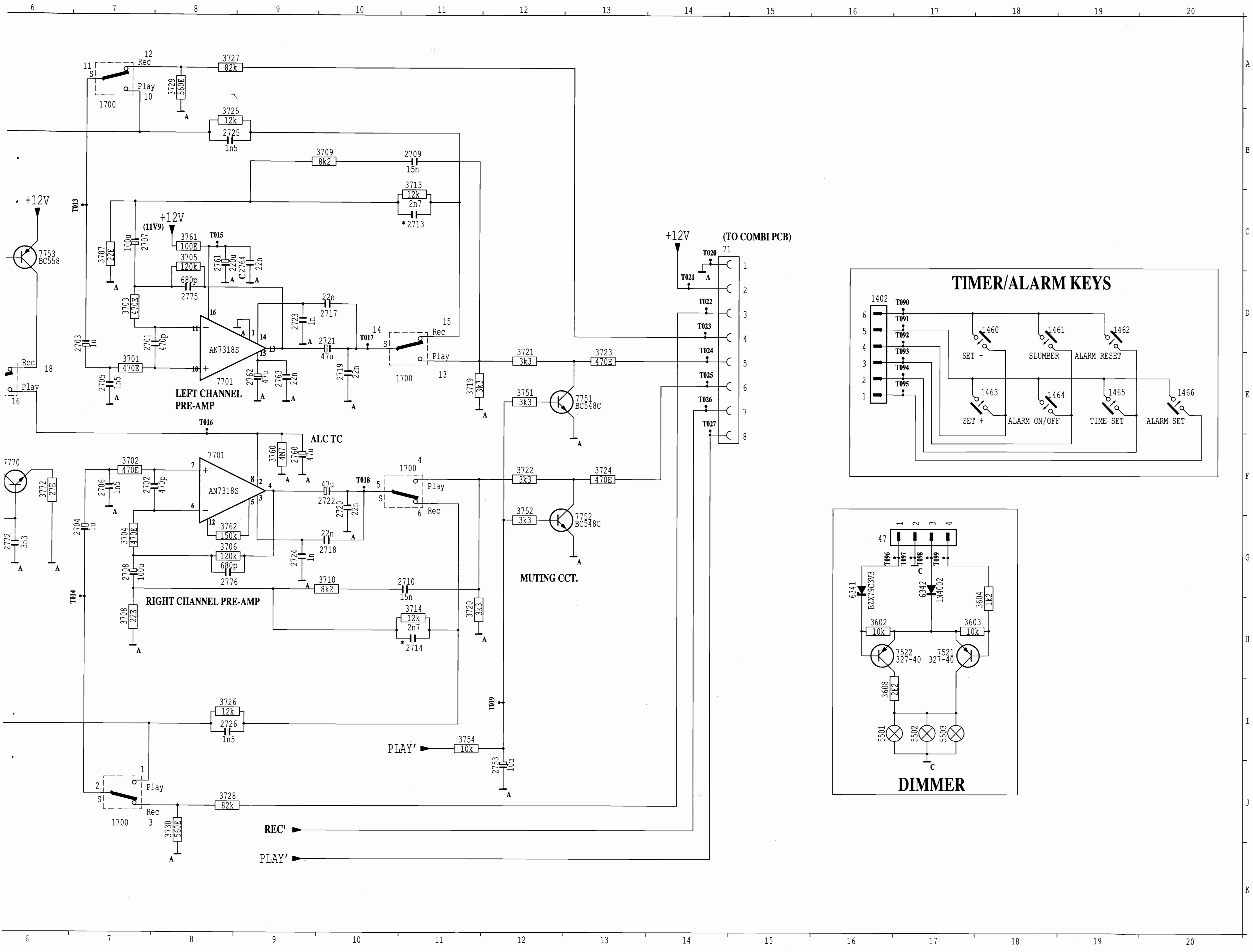
CONDITION = CD MODE UPON POWER UP
+A = 19.5V
+B = 11.7V
+D = 5.6V
CD SERVO = 10.3V
+A' = 2.3V
+E = 4.7V
+D' = 4.7V


7313
AN7147
INPUT CIRCUIT
DRIVING CIRCUIT
SEPP OUTPUT CIRCUIT
THERMAL PROTECTION CIRCUIT
CROSSOVER DISTORTION PREVENTION C
IN1
NF1
NF2
IN2
OUT1
OUT2
BS1
BS2
RF
PS
GNDI
GNDO
1251
HEADPHONE
1221
7505
NJM4560
7504
NJM4560
7403
7404
7405
BC548C
7513
BC337_25
7514
BC337_25
7519
BC548B
7520
BC548B
MIC-L
MIC-R
REC_L
REC_R
PWM
MUTE
DBB
BUZZER
STANDBY
POWERDOWN
CD_SERVO
1420
7270
BC548C
1273
1772
7254
BD135
7255
BC548C
7252
BD436
7272
BC558
7271
BC548
+5V6
-CMOS
-5V
FOR KARAOKE VERSION ONLY
1551
MIC-L
MIC-R
7503
CXA1644P
DAC
ADC
FIFO Memory
OSC
VREF
IV1
IV2
AMP_IN
OUT
IN
IC
DETC1
DETC2
DETC3
DETC4
FADJ
AGND
DGND
DVcc
AVcc

1221	D28
1251	D27
1273	H29
1420	G21
1467	I 5
1469	L 5
15	D 4
1551	J 9
1553	F 5
1601	J 6
1765	A 4
1772	I21
2201	C20
2202	D20
2203	D20
2204	C19
2205	C19
2221	D24
2223	C24
2224	C22
2225	E23
2227	D25
2228	C25
2232	J23
2233	J25
2234	J23
2240	D25
2244	J26
2251	E20
2252	F20
2253	E20
2254	F19
2255	E19
2256	M26
2257	M25
2258	L22
2259	L22
2260	L27
2261	O28
2266	O27
2271	D24
2277	E25
2278	E25
2290	E25
2291	F28
2292	D28
2429	B14
2430	E14
2437	B16
2438	B15
2501	D 6
2502	E 6
2503	F 6
2504	F 6
2505	G 9
2506	E 9
2510	F10
2511	C11
2512	F11
2513	B12
2514	E12
2515	C 9
2516	E 9
2517	C10
2518	F10
2519	C10
2520	C11
2521	F 7
2522	D 9
2523	B11
2524	G12
2525	F11
2526	B11
2527	C16
2528	E16
2529	C16
2530	E16
2531	D16
2532	F16
2533	B10
2534	E16
2535	E15
2537	C12
2538	F12
2571	D18
2601	I 6
2638	N13
2639	K14
2640	K13
2643	K11
2644	K10
2651	J11
2652	J10
2658	K12
2659	K11
2661	I17
2662	I15
2663	I16
2664	I16
2665	J17
2666	J15
2667	K14
2668	K15
2669	K16
2670	K16
2671	K17
2672	K17
2673	K18
2674	K18
2675	N15
2676	N16
2677	O18
2678	K15
2679	J15
2680	K16
2681	K17
2682	N17
2684	O17
2685	I12
2686	I15
3221	D20
3223	D25
3227	D25
3240	E28
3252	J23
3254	J24
3255	L26
3256	L26
3257	L25
3258	L25
3259	L25
3260	M25
3261	M25
3262	L23
3263	M23
3264	N23
3265	L23
3266	N23
3267	I25
3269	O28
3271	F20
3273	C23
3275	D25
3277	F25
3290	E28
3315	C19
3316	F19
3501	D 5
3502	D 5
3503	D 6
3504	E 6
3505	E 6
3506	F 6
3507	F 6
3508	F 6
3509	C 9
3510	C 9
3511	G10
3512	E10
3513	G 9
3514	G 8
3515	C10
3516	E10
3517	D11
3518	F11
3519	B10
3520	E10
3521	B10
3523	B11
3524	B11
3525	B12
3526	E12
3527	C12
3528	E12
3529	B13
3530	E13
3531	C13
3532	F13
3533	C14
3534	F13
3535	A15
3556	E17
3566	G14
3567	D17
3568	E17
3569	D18
3570	E18
3571	E18
3573	C18
3574	E18
3601	I 6
3605	I 8
3607	I 8
3630	G21
3631	G22
3661	K11
3662	J11
3663	J11
3664	I10
3668	J12
3673	K13
3679	I14
3680	I14
3681	J14
3682	J15
3683	J15
3684	K16
3685	M13
3686	J16
3687	J16
3688	I16
3689	J16
3690	J17
3691	J18
3692	J15
3693	K16
3694	J17
3695	N18
3697	N18
3801	C16
3802	E16
3803	C16
3804	E16
3805	D15
3806	F15
3807	G15
3810	G12
5630	K10
5631	H12
6252	K24
6253	M24
6254	L24
6255	J23
6261	O27
6502	D 9
6503	B15
6505	E18
7252	K25
7254	I23
7255	J24
7270	G21
7271	N25
7272	M24
7313	C21
7403	B13
7404	E13
7405	B15
7501	D 7
7503	M19
7504	K12
7504	J12
7505	C11
7505	E11
7513	C17
7514	F17
7519	D16
7520	F16
7523	I 7
86	E 4
9100	I13
9501	E 5
9502	F 5


TAPE FUNCTION
TAPE DECK
PLAY SW
1704
1702
1703
AC ERASE
LEFT
RIGHT
(T0 R/P HEAD)
T001
T002
T003
T004
T005
T006
T007
T008
T009
T010
T012
T013
T014
T015
T016
T017
T018
T019
T020
T021
T022
T023
T024
T025
T026
T027
+12V
(11V9)
PLAY'
REC'
3758 10k
3759 10k
3773 1k
2780* 470p
1780*
RIF SW (SVC SOLN)
2774 15n
5770
BIAS OSCILLATOR
7770 BC337/40
3770 120E
2770 10F
3774 33E
3771 68k
2771 4n7
2772 3n3
3772 27E
6701 8V2
3775 390E
7753 BC558
1700
Rec
Play
3757 10k
3756 10k
3727 82k
3729 560E
3725 12k
2725 1n5
3709 8k2
2709 15n
3713 12k
2n7
*2713
3707 22E
2707 100u
3761 100E
3705 120k
680p
2775
2761 220u
C2764 22n
3703 470E
2703 1u
2701 470p
3701 470E
2705 1n5
AN7318S
7701
LEFT CHANNEL PRE-AMP
2723 1n
2717 22n
2721 47u
2762 47u
2763 22n
2719 22n
3719 3k3
3721 3k3
3723 470E
3751 3k3
7751 BC548C
ALC TC
3760 4M7
2760 47u
3702 470E
2706 1n5
2702 470p
2704 1u
3704 470E
3762 150k
3706 120k
680p
2776
2708 100u
3708 22E
RIGHT CHANNEL PRE-AMP
2722 47u
2720 22n
2718 22n
2724 1n
3710 8k2
2710 15n
3714 12k
2n7
*2714
3720 3k3
3722 3k3
3724 470E
3752 3k3
7752 BC548C
MUTING CCT.
3754 10k
2753 10u
3726 12k
2726 1n5
3728 82k
3730 560E
(TO COMBI PCB)
71
A

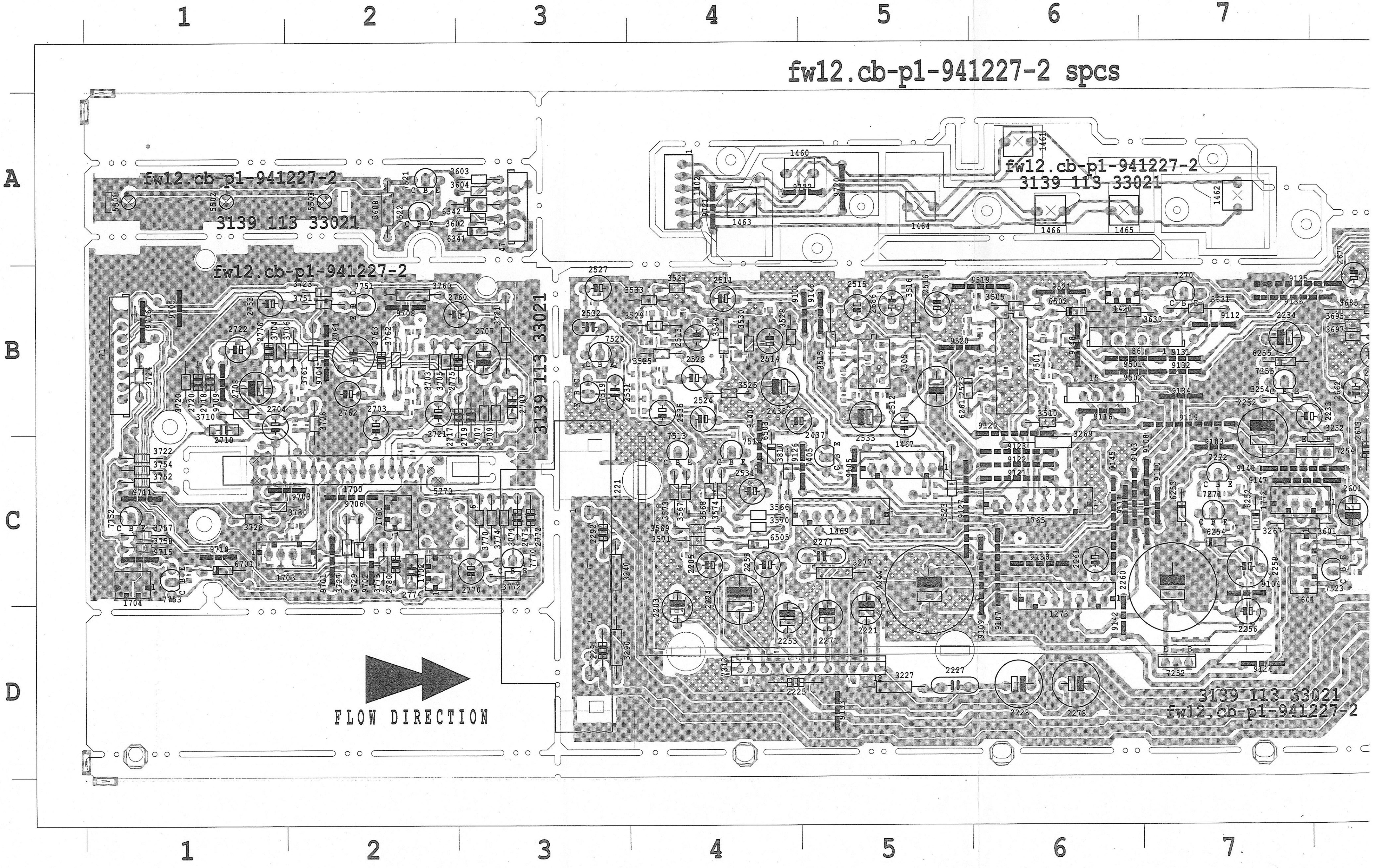
* RIF SWITCH (SERVICE SOLUTION ONLY)


LEFT CHANNEL PRE-AMP
RIGHT CHANNEL PRE-AMP
ALC TC
MUTING CCT.
(TO COMBI PCB)
TIMER/ALARM KEYS
DIMMER
AN7318S
7701
7751 BC548C
7752 BC548C
7753 BC558
+12V
(11V9)
Rec
Play
1700
PLAY'
REC'
SET -
SLUMBER
ALARM RESET
SET +
ALARM ON/OFF
TIME SET
ALARM SET
1402
47
6341 BZX79C3V3
6342 1N4002
7522 327-40
7521 327-40
5501
5502
5503

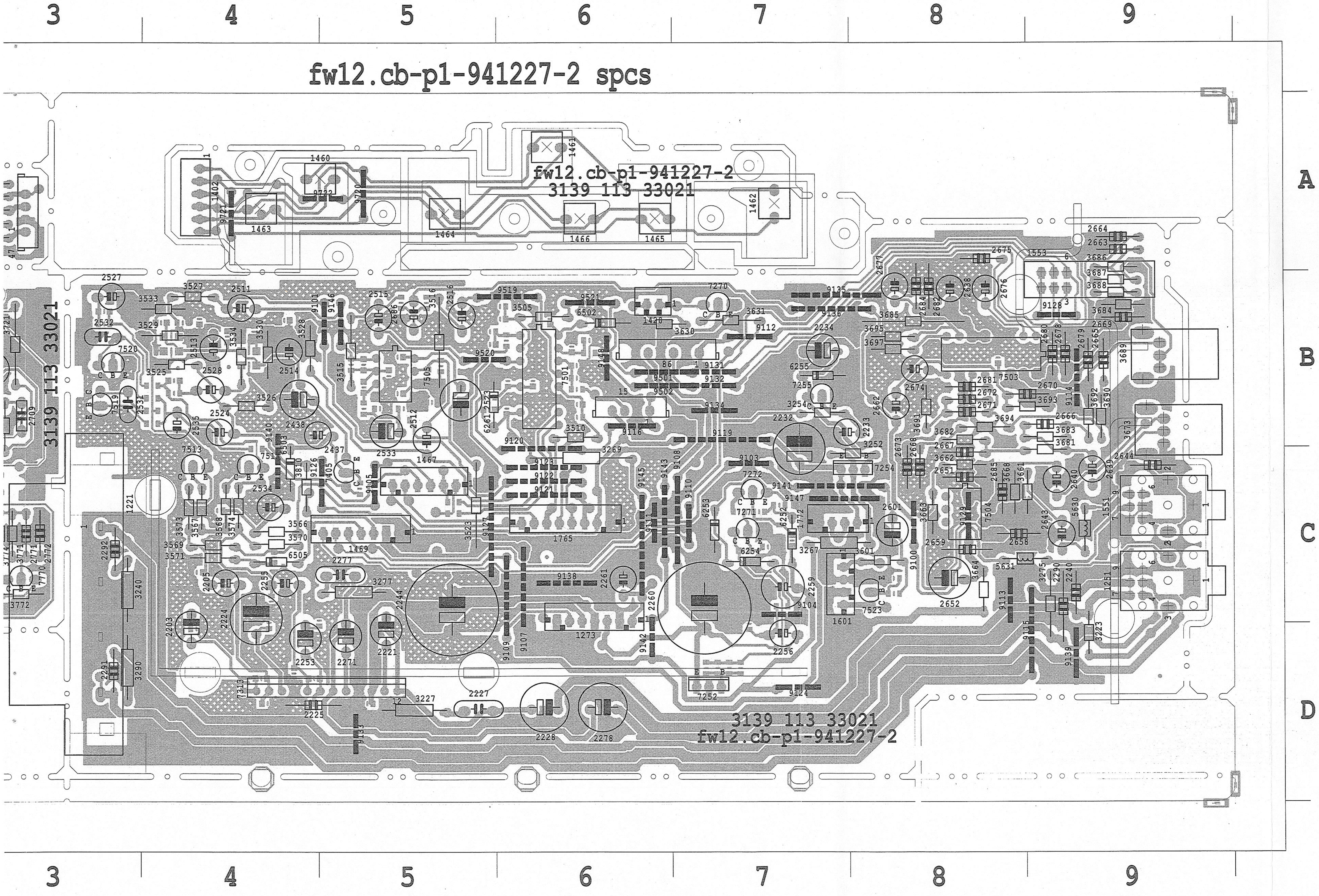
1402	D16
1460	D18
1461	D18
1462	D19
1463	E18
1464	E18
1465	E19
1466	E20
1700	J 7
1700	F11
1700	G 3
1700	B 7
1700	E10
1700	E 5
1702	D 2
1703	E 2
1704	D 2
1780	F 2
2701	D 7
2702	F 7
2703	D 7
2704	G 7
2705	E 7
2706	F 7
2707	C 7
2708	G 7
2709	B11
2710	G11
2713	C11
2714	H11
2717	D10
2718	G10
2719	E10
2720	F10
2721	D10
2722	F10
2723	D 9
2724	G 9
2725	B 8
2726	I 8
2753	J12
2760	F 9
2761	C 8
2762	E 9
2763	E 9
2764	C 9
2770	G 4
2771	G 5
2772	G 6
2774	F 3
2775	D 8
2776	G 8
2780	F 3
3602	H16
3603	H17
3604	H18
3608	I16
3701	E 7
3702	F 7
3703	D 7
3704	G 7
3705	C 8
3706	G 8
3707	C 7
3708	H 7
3709	B10
3710	G10
3713	B11
3714	H11
3719	E11
3720	H11
3721	E12
3722	F12
3723	E13
3724	F13
3725	B 8
3726	I 8
3727	A 8
3728	J 8
3729	A 8
3730	J 8
3751	E12
3752	F12
3754	I11
3756	I 4
3757	H 4
3758	C 2
3759	D 2
3760	F 9
3761	C 8
3762	G 8
3770	E 4
3771	F 5
3772	F 6
3773	F 2
3774	F 5
3775	C 5
47	G16
5501	I16
5502	I17
5503	I17
5770	F 4
6341	G16
6342	G17
6701	C 5
71	C14
7521	H17
7522	H17
7701	F 8
7701	E 8
7751	E13
7752	G13
7753	C 6
7770	F 6

COMBI LAYOUT (COMPONENT SIDE)

1463 A 4	2709 B 3	2770 C 3	3705 B 2	3729 C 2	3773 C 2	7753 C 1	9716 B 1	1551 C 9	2233 B 7	2290 C 9	2527 B 3	2651 C 8	2671 B 8	2685 C 8	3510 B 6	3567 C 4	3664 C 8	3691 B 8	6261 B 5
1464 A 5	2710 B 1	2771 C 3	3706 B 2	3730 C 1	3774 C 3	7770 C 3	9720 A 5	1553 B 9	2234 B 7	2291 D 3	2528 B 4	2652 C 8	2672 B 8	2686 B 5	3515 B 5	3568 C 4	3668 C 8	3692 B 9	6502 B 6
1465 A 6	2717 B 3	2772 C 3	3707 B 3	3751 B 2	5501 A 1	9701 C 2	9721 A 4	1601 C 7	2240 C 9	2292 C 3	2531 B 3	2658 C 8	2673 C 8	3223 D 9	3516 B 5	3569 C 4	3673 B 9	3693 B 9	6503 C 4
1466 A 6	2718 B 1	2774 C 2	3708 B 2	3752 C 1	5502 A 1	9702 C 2	9722 A 5	1765 C 6	2244 C 5	2437 B 4	2532 B 3	2659 C 8	2674 B 8	3227 D 5	3523 C 5	3570 C 4	3681 C 9	3694 B 8	6505 C 4
1700 C 2	2719 B 3	2775 B 3	3709 B 3	3754 C 1	5503 A 2	9703 C 2	----	1772 C 7	2253 D 4	2438 B 4	2533 B 5	2662 B 8	2675 A 8	3240 C 3	3525 B 4	3571 C 4	3682 B 8	3695 B 8	7252 D 7
1702 C 2	2720 B 1	2776 B 1	3710 B 1	3757 C 1	5770 C 2	9704 B 2	15 B 6	2203 D 4	2255 C 4	2511 B 4	2534 C 4	2663 A 9	2676 B 8	3252 C 8	3526 B 4	3573 C 4	3683 B 9	3697 B 8	7254 C 8
1703 C 1	2721 B 2	2780 C 2	3720 B 1	3758 C 1	6341 A 3	9705 B 1	86 B 6	2205 C 4	2256 D 7	2512 B 5	2535 B 4	2664 A 9	2677 B 8	3254 B 7	3527 B 4	3574 C 4	3684 B 9	3810 C 4	7255 B 7



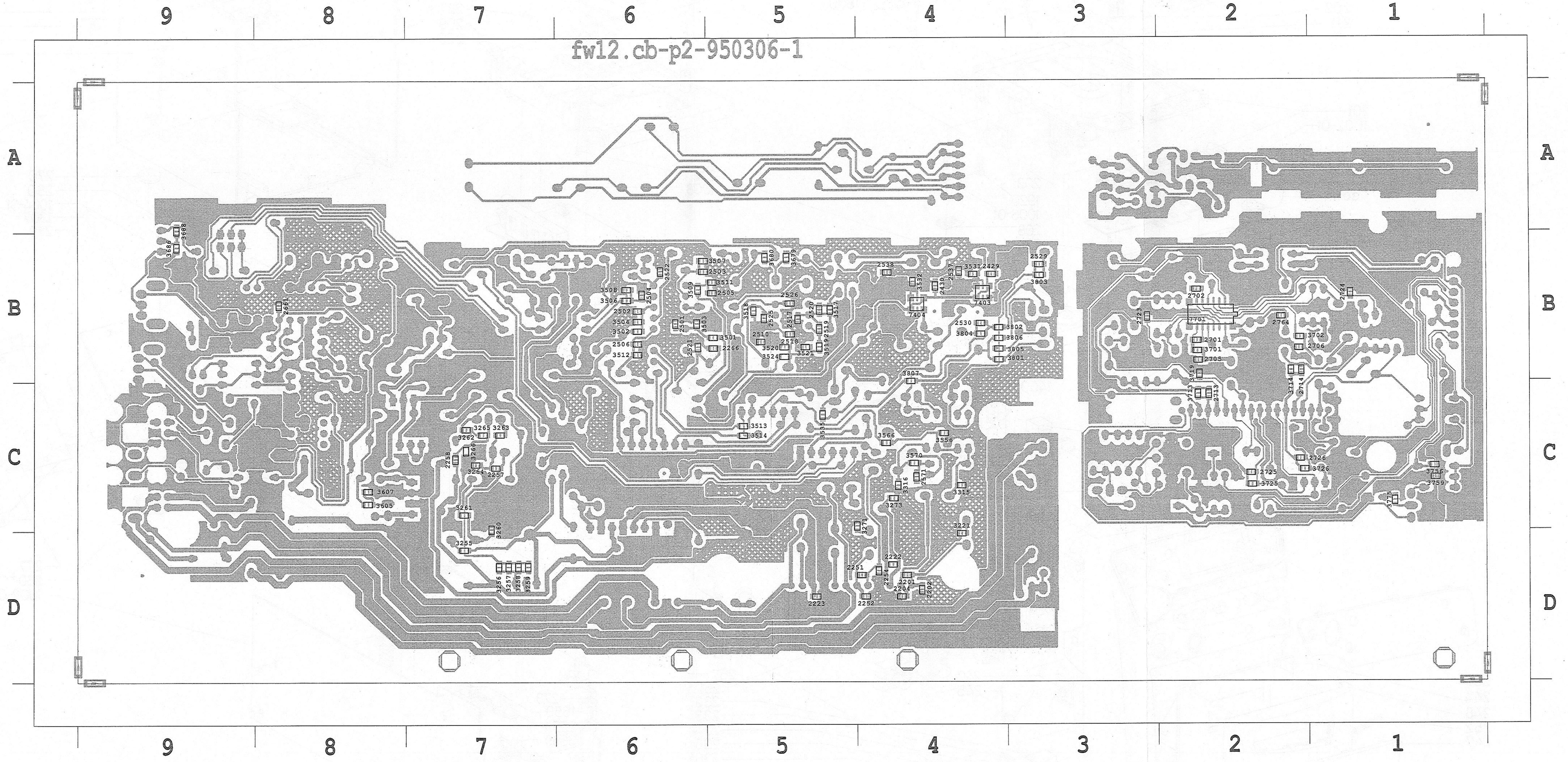
9716 B 1	1551 C 9	2233 B 7	2290 C 9	2527 B 3	2651 C 8	2671 B 8	2685 C 8	3510 B 6	3567 C 4	3664 C 8	3691 B 8	6261 B 5	7503 B 8	9107 C 6	9122 C 6	9138 C 6	9520 B 5
9720 A 5	1553 B 9	2234 B 7	2291 D 3	2528 B 4	2652 C 8	2672 B 8	2686 B 5	3515 B 5	3568 C 4	3668 C 8	3692 B 9	6502 B 6	7504 C 8	9108 C 7	9123 C 6	9139 D 9	9521 B 6
9721 A 4	1601 C 7	2240 C 9	2292 C 3	2531 B 3	2658 C 8	2673 C 8	3223 D 9	3516 B 5	3569 C 4	3673 B 9	3693 B 9	6503 C 4	7505 B 5	9109 C 6	9124 D 7	9140 C 4	
9722 A 5	1765 C 6	2244 C 5	2437 B 4	2532 B 3	2659 C 8	2674 B 8	3227 D 5	3523 C 5	3570 C 4	3681 C 9	3694 B 8	6505 C 4	7513 C 4	9110 C 7	9126 C 5	9141 C 7	
----	1772 C 7	2253 D 4	2438 B 4	2533 B 5	2662 B 8	2675 A 8	3240 C 3	3525 B 4	3571 C 4	3682 B 8	3695 B 8	7252 D 7	7514 C 4	9111 C 6	9127 C 5	9142 D 6	
15 B 6	2203 D 4	2255 C 4	2511 B 4	2534 C 4	2663 A 9	2676 B 8	3252 C 8	3526 B 4	3573 C 4	3683 B 9	3697 B 8	7254 C 8	7519 B 3	9112 B 7	9128 B 9	9143 C 6	
86 B 6	2205 C 4	2256 D 7	2512 B 5	2535 B 4	2664 A 9	2677 B 8	3254 B 7	3527 B 4	3574 C 4	3684 B 9	3810 C 4	7255 B 7	7520 B 3	9113 C 8	9129 C 8	9145 C 6	


3
4
5
6
7
8
9
fw12.cb-p1-941227-2 spcs
fw12.cb-p1-941227-2
3139 113 33021
3139 113 33021
fw12.cb-p1-941227-2
A
B
C
D

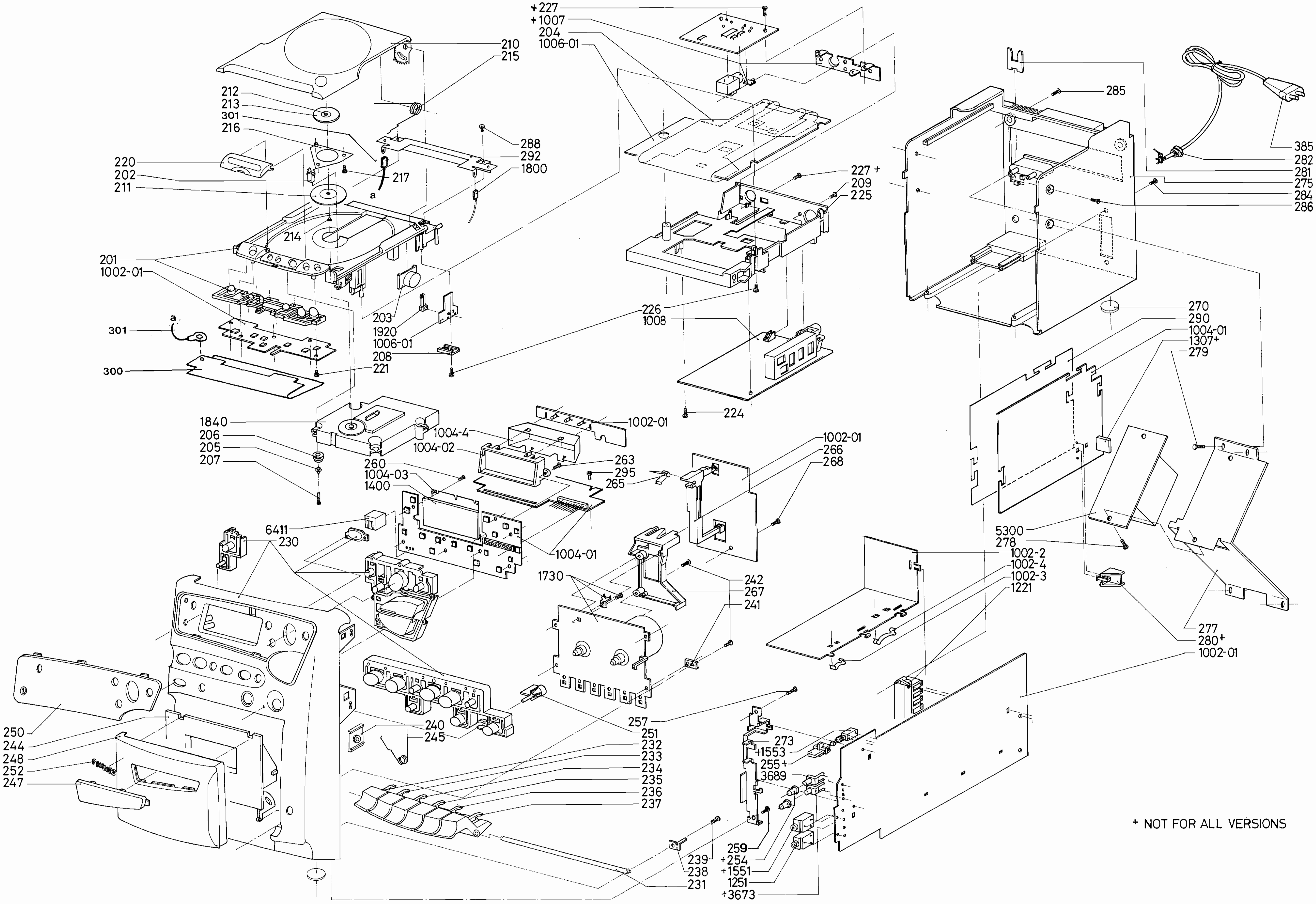
COMBI LAYOUT (COPPER SIDE)

2701	B	2
2702	B	2
2705	B	2
2706	B	2
2713	C	2
2714	B	2
2723	B	3
2724	B	1
2725	C	2
2726	C	2
2764	B	2
3701	B	2
3702	B	2
3713	C	2
3714	B	2
3719	B	2
3725	C	2
3726	C	2
3756	C	1
3759	C	1
3775	C	1
7701	B	2

2201	D	4
2202	D	4
2204	D	4
2222	D	4
2223	D	5
2251	D	4
2252	D	4
2254	D	4
2257	C	7
2258	C	7
2266	B	5
2429	B	4
2430	B	4
2501	B	6
2502	B	6
2503	B	6
2504	B	6
2505	B	5
2506	B	6
2510	B	5
2517	B	5
2518	B	5
2519	B	5
2520	B	5
2521	B	6
2522	B	6
2525	B	5
2526	B	5
2529	B	3
2530	B	4
2537	B	4
2538	B	4
2571	C	4
2661	B	8
3221	D	4
3255	D	7
3256	D	7
3257	D	7
3258	D	7
3259	D	7
3260	C	7
3261	C	7
3262	C	7
3263	C	7
3264	C	7
3265	C	7
3266	C	7
3271	C	4
3273	C	4
3315	C	4
3316	C	4
3501	B	5
3502	B	6
3503	B	6
3504	B	6
3506	B	6
3507	B	6
3508	B	6
3509	B	6
3511	B	5
3512	B	6
3513	C	5
3514	C	5
3517	B	5
3518	B	5
3519	B	5
3520	B	5
3521	B	5
3524	B	5
3531	B	4
3532	B	4
3535	C	5
3556	C	4
3566	C	4
3570	C	4
3605	C	8
3607	C	8
3679	B	5
3680	B	5
3686	B	9
3688	A	9
3801	B	4
3802	B	4
3803	B	3
3804	B	4
3805	B	4
3806	B	4
3807	C	4
7403	B	4
7404	B	4



SET EXPLODED VIEW



+227
+1007
204
1006-01
210
215
212
213
301
216
220
202
211
288
292
1800
217
a
214
201
1002-01
203
1920
1006-01
208
221
301
a
300
285
385
282
281
275
284
286
227 +
209
225
226
1008
224
270
290
1004-01
1307+
279
1840
206
205
207
1004-4
1004-02
1002-01
260
1004-03
1400
263
295
265
1002-01
266
268
6411
230
1004-01
1730
242
267
241
5300
278
1002-2
1002-4
1002-3
1221
277
280+
1002-01
250
244
248
252
247
240
245
257
251
232
233
234
235
236
237
273
+1553
255+
3689
259
+254
+1551
1251
+3673
239
238
231

+ NOT FOR ALL VERSIONS

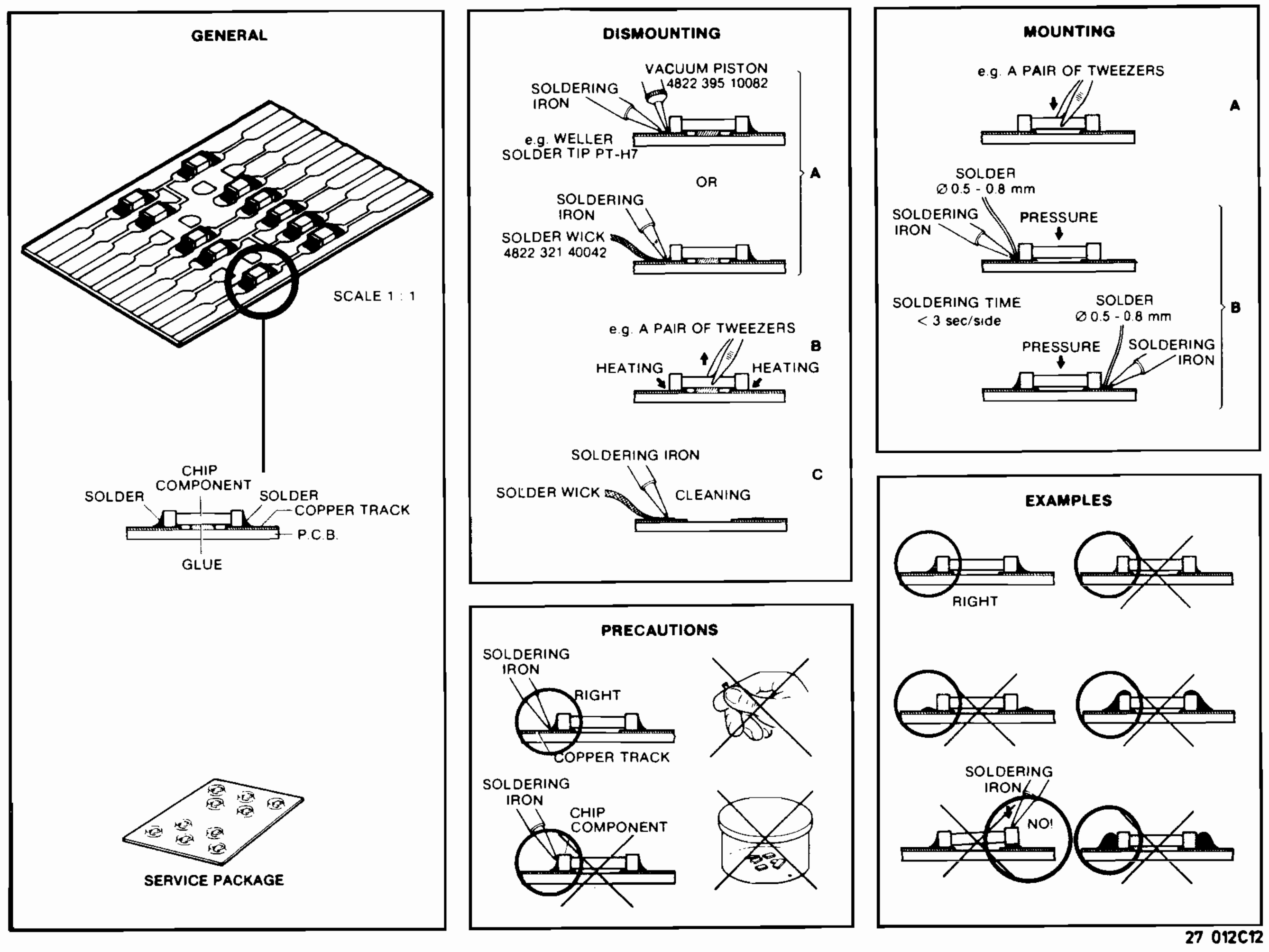
SET MECHANICAL PARTLIST

201	4822 426 40463	Cabinet top
202	4822 276 13079	Latch switch
203	4822 529 10257	Damper assy
205	4822 532 61104	Distance-holder
206	4822 532 61103	Damper
210	4822 444 61047	CD door
211	4822 466 93464	Stabiliser disc
212	4822 532 12311	Metal ring
215	4822 492 52332	Spring CD
220	4822 444 61048	Clock door
225	4822 464 70659	Frame tuning
230	4822 426 51811	Cabinet front
232	4822 410 63687	Button RECORD
233	4822 410 63688	Button PLAY
234	4822 410 63689	Button REW
235	4822 410 63691	Button FWD
236	4822 410 63692	Button STOP
237	4822 410 63693	Button PAUSE
240	4822 529 10257	Damper assy
244	4822 443 63703	Door cass right
245	4822 492 71143	Spring
247	4822 432 93283	Window cover
248	4822 443 64435	Cassette door cover
250	4822 450 62414	Window display
251	4822 466 70789	Light guide
265	4822 492 71467	Spring-record
266	4822 404 21337	Bracket record
270	4822 462 40683	Plate (foot)
273	4822 404 21335	Bracket karaoke
275	4822 426 20259	Cabinet rear
275	4822 426 20257	Cabinet rear /25
275	4822 426 20257	Cabinet rear /21
280	4822 404 21338	Voltage sel bracket /21
281	4822 404 21336	Mains bracket
282	4822 532 60948	Bush
295	4822 462 40379	Buffer

LIST OF SCREWS

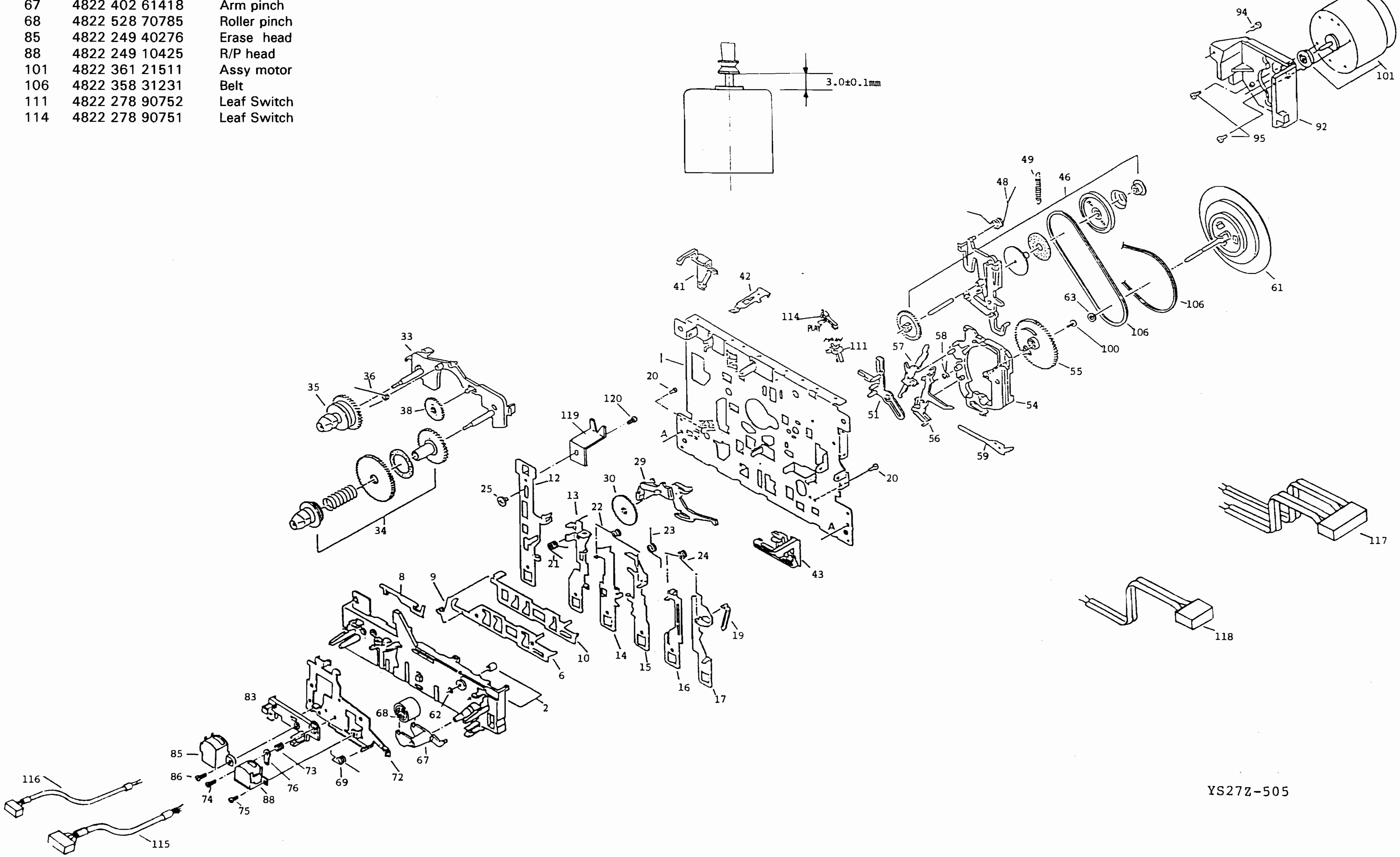
207	SCR PAN TORX TAP ST ZN BK 2X16
209	SCR PAN TORX TAP ST ZN BK 3X12
214	CSK SCR ST ZN BK M2 X 4
217	SCR PAN TORX TAP ST ZN BK 3X10
221	SCR PAN TORX TAP ST ZN BK 2X8
224	SCR PAN TORX TAP ST ZN BK 3X12
226	SCR PAN TORX TAP ST ZN BK 3X12
239	SCR PAN TORX TAP ST ZN BK 3X12
242	SCR PAN TORX TAP ST ZN BK 3X12
257	SCR PAN TORX TAP ST ZN BK 3X12
259	SCR PAN TORX TAP ST ZN BK 3X12
260	SCR PAN TORX TAP ST ZN BK 3X12
263	SCR PAN TORX TAP ST ZN BK 3X12
268	SCR PAN TORX TAP ST ZN BK 3X12
278	SCR WASH TORX TAP ST ZN 3X6
279	SCR WASH PAN TORX ST ZN 3X16
284	SCR WASH PAN TORX ST ZN 3X12
285	SCR WASH PAN TORX ST ZN 3X12
286	SCR WASH PAN TORX ST ZN 3X12
288	SCR PAN TORX TAP ST ZN BK 3X12

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON 4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
A
SOLDERING IRON
SOLDER WICK 4822 321 40042
e.g. A PAIR OF TWEEZERS
B
HEATING
HEATING
SOLDERING IRON
C
SOLDER WICK
CLEANING
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER ∅ 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME < 3 sec/side
SOLDER ∅ 0.5 - 0.8 mm
B
PRESSURE
SOLDERING IRON
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

TAPE DECK EXPLODED VIEW

67	4822 402 61418	Arm pinch
68	4822 528 70785	Roller pinch
85	4822 249 40276	Erase head
88	4822 249 10425	R/P head
101	4822 361 21511	Assy motor
106	4822 358 31231	Belt
111	4822 278 90752	Leaf Switch
114	4822 278 90751	Leaf Switch


3.0±0.1mm
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101
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YS27Z-505

Tuner Board (ECO4VA)

MISCELLANEOUS

1101	4822 267 10283	Socket Coax IEC 75Ω
1105	4822 265 31184	JST Conn. frame ant.

2100	4822 122 33195	100pF 10% 50V
2104	4822 122 33195	100pF 10% 50V
2107	5322 122 34123	1nF 10% 50V
2110	5322 122 32658 @	22pF 5% 50V
2112	4822 122 33496	100nF 10% 63V
2113	4822 125 50355 @	Trimcap. 4-20P
2114	5322 122 32531 @	100pF 5% 50V
2115	4822 125 60101	3p0-11pF N45 100V
2120	5322 122 32268	470pF 10% 50V
2121	5322 122 32481	15pF 5% 50V
2122	5322 122 34123	1nF 10% 50V
2123	5322 122 34123	1nF 10% 50V
2124	4822 121 51387	10nF 20% 16V
2125	5322 122 31946 @	27pF 5% 63V
2126	4822 122 33496 @	100nF 10% 63V
2129	4822 121 43705 @	390pF 1% 160V
2134	4822 122 33197	1nF 10% 50V
2135	4822 121 70245	560pF 1% 160V
2136	5322 122 31946	27pF 5% 63V
2138	5322 122 32659	33pF 5% 50V
2139	4822 122 33175 @	2.2nF 20% 50V
2141	4822 124 40244	2.2µF 20% 63V
2142	4822 124 40242	1µF 20% 63V
2143	4822 124 40239	0.47µF 20% 63V
2144	4822 124 40239	0.47µF 20% 63V
2147	4822 122 33177	10nF 20% 50V
2150	4822 124 40248	10µF 20% 63V
2151	4822 124 40248	10µF 20% 63V
2154	4822 122 33893	18nF 10% 63V
2155	4822 122 33893	18nF 10% 63V
2160	4822 124 40242	1µF 20% 63V
2161	4822 124 40242	1µF 20% 63V
2167	4822 122 33496	100nF 10% 63V
2169	5322 122 31863	330pF 5% 50V
2170	4822 126 11714	4.7nF 20%
2171	5322 126 10223	4.7nF 10% 63V
2172	4822 124 41631	1.5µF 50V
2173	4822 124 40433	47µF 20% 25V
2177	4822 126 12882 @	100nF +80-20% 50V
2178	4822 122 33197	1nF 10% 50V
2179	4822 122 33195	100pF 10% 50V
2180	5322 122 31946	27pF 5% 63V
2181	4822 122 32139	12pF 2% 63V
2183	4822 122 33496	100nF 10% 63V
2184	4822 124 41584	100µF 20% 10V
2185	4822 122 33496	100nF 10% 63V
2186	5322 122 34123	1nF 10% 50V

3106	4822 051 20104	100k 5% 0.1W
3107	4822 051 20222 @	2k2 5% 0.1W
3108	4822 051 20104	100k 5% 0.1W
3109	4822 051 20222 @	2k2 5% 0.1W
3112	4822 116 52176	10Ω 5% 0.5W
3119	4822 116 52224	470Ω 5% 0.5W
3120	4822 116 52289	5k6 5% 0.5W
3121	4822 051 20104	100k 5% 0.1W
3122	4822 051 20471	470Ω 5% 0.1W
3123	4822 051 20223	22k 5% 0.1W
3124	4822 116 52256 @	2k2 5% 0.5W
3125	4822 051 20472 @	4k7 5% 0.1W
3128	4822 117 10833	10k 1% 0.1W
3129	4822 051 20472 @	4k7 5% 0.1W
3132	4822 116 52283	4k7 5% 0.5W
3141	4822 116 52215	220Ω 5% 0.5W
3142	4822 051 20222	2k2 5% 0.1W
3144	4822 117 10833	10k 1% 0.1W
3147	4822 051 20184	180k 5% 0.1W
3148	4822 100 11163	100k 30%LIN 0.1W
3149	4822 051 20563	56k 5% 0.1W
3151	4822 116 52243	1k5 5% 0.5W
3153	4822 051 20683 #	68k 5% 0.1W
3156	4822 116 83864	10k 5% 0.5W
3157	4822 051 20273	27k 5% 0.1W
3159	4822 051 20563	56k 5% 0.1W
3162	4822 050 11002	1k 1% 0.4W
3163	4822 050 11002	1k 1% 0.4W
3167	4822 051 20008	0Ω 0 Jump
3170	4822 116 52283	4k7 5% 0.5W
3171	4822 051 20101	100Ω 5% 0.1W
3172	4822 051 20472	4k7 5% 0.1W
3173	4822 116 52244	15k 5% 0.5W
3174	4822 116 83864	10k 5% 0.5W
3175	4822 051 20104	100k 5% 0.1W
3176	4822 051 20101	100Ω 5% 0.1W
3177	4822 116 83864 @	10k 5% 0.5W
3183	4822 051 20223	22k 5% 0.1W
3184	4822 051 20223	22k 5% 0.1W
3186	4822 051 20104	100k 5% 0.1W
3188	4822 051 10102	1k 2% 0.25W
3189	4822 116 52249	1k8 5% 0.5W
3190	4822 116 52249	1k8 5% 0.5W
3191	4822 116 52249	1k8 5% 0.5W
3192	4822 116 52249	1k8 5% 0.5W
3193	4822 116 52256	2k2 5% 0.5W
3194	4822 116 52219	330Ω 5% 0.5W
3195	4822 116 52219	330Ω 5% 0.5W
3197	4822 116 52219	330Ω 5% 0.5W
3206	4822 116 52215 #	220Ω 5% 0.5W
3210	4822 051 20008	0Ω 0 Jump
3211	4822 051 10008	0Ω 5% 0.25W
3212	4822 051 10008	0Ω 5% 0.25W
3213	4822 051 10008	0Ω 5% 0.25W
3221	4822 051 20008	0Ω 0 Jump
3222	4822 051 20008 #	0Ω 0 Jump
3224	4822 051 20008	0Ω 0 Jump
3226	4822 051 20008	0Ω 0 Jump
3228	4822 051 10008	0Ω 5% 0.25W
3229	4822 051 20008 #	0Ω 0 Jump
3231	4822 051 20008	0Ω 0 Jump
3235	4822 051 20008	0Ω 0 Jump
3236	4822 051 10008 #	0Ω 5% 0.25W
3237	4822 051 10008	0Ω 5% 0.25W
3238	4822 051 20008 @	0Ω 0 Jump
3240	4822 051 10479	47Ω 2% 0.25W
3241	4822 051 20008 #	0Ω 0 Jump
3242	4822 051 10008	0Ω 5% 0.25W
3243	4822 051 20008 #	0Ω 0 Jump
3244	4822 051 20008	0Ω 0 Jump
3245	4822 051 20008 @	0Ω 0 Jump
3246	4822 051 10008	0Ω 5% 0.25W
3247	4822 051 10008	0Ω 5% 0.25W
3248	4822 051 10008	0Ω 5% 0.25W

5107	4822 157 71094 @	MW ANT.Coil. 3-BAND
5107	4822 157 63835 #	MW ANT.Coil. 2-BAND
5108	4822 157 71093 @	LW ANT. Coil
5109	4822 156 30947	RF Coil 1.5 T
5120	4822 156 30947	RF Coil 1.5 T
5122	4822 157 60517 @	Osc. Coil LW
5123	4822 157 60517	Osc. Coil MW
5125	4822 157 61898 #	0.47µH
5140	4822 158 60511	AM-IF Filter 450KHZ
5142	4822 157 70302	AM-IF Filter 450KHZ
5143	4822 242 70665	Ceram Filter 10.7MHZ
5144	4822 242 70665	Ceram Filter 10.7MHZ
5145	4822 242 81362	Cer Discriminator
5170	4822 242 72976	Cer. Reson. 7.2MHZ

6105	4822 130 83075	HN1V02H tuning diode
6109	4822 130 82833	1SV228 tuning diode
6122	4822 130 30621 #	1N4148
6124	4822 130 82833	1SV228 tuning diode
6140	4822 130 30621	1N4148 (UAW)
6154	4822 130 30621	1N4148 (UAW)
6170	4822 130 30621 #	1N4148
6174	4822 130 34233	BZX79-B5V1

7102	4822 130 42615 @	BC817-40 (UAW)
7104	5322 130 42136 @	BC848C (UAW)
7105	4822 130 60093	2SA838B
7120	4822 130 60163	2SC1047
7121	5322 130 42136 @	BC848C (UAW)
7123	5322 130 42136 @	BC848C (UAW)
7128	5322 130 42136 @	BC848C (UAW)
7140	4822 209 32701	TEA5712T/N2 (RF IC)
7168	5322 130 41983	BC858B
7170	5322 130 42136	BC848C (UAW)
7171	5322 130 42136	BC848C (UAW)
7172	5322 209 11517	PC74HCU04T inverter
7173	4822 209 31998	LC7218M Synthesizer
7179	5322 130 42136 @	BC848C (UAW)

@ for FRAM/00
# for FRAM/01

Note : Only the parts mentioned in this list are normal service spare parts.

Tuner Board (Tuner 92)

MISCELLANEOUS

1101	4822 210 10492	Tuner FE415-G11
1110	4822 267 10283	Antenna socket

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2101	5322 122 34099	470pF 10% 63V
2102	5322 122 32268	470pF 10% 50V
2103	4822 124 40433	47µF 20% 25V
2104	4822 121 42408	220nF 5% 63V
2105	5322 122 32654	22nF 10% 63V
2108	5322 122 32654	22nF 10% 63V
2109	5322 122 32654	22nF 10% 63V
2110	5322 122 32654	22nF 10% 63V
2111	4822 122 32927	220nF +80-20% 50V
2112	5322 122 32654	22nF 10% 63V
2113	5322 122 32661	56pF 5% 50V
2114	5322 124 41431	22µF 20% 35V
2115	4822 124 40239	0.47µF 20% 63V
2116	5322 121 42386	100nF 5% 63V
2117	4822 122 33336	8.2nF 10% 50V
2118	4822 122 33336	8.2nF 10% 50V
2119	4822 124 40244	2.2µF 20% 63V
2120	4822 124 40244	2.2µF 20% 63V
2121	4822 124 40196	220µF 20% 16V
2123	4822 124 40246	4.7µF 20% 63V
2124	4822 124 40246	4.7µF 20% 63V
2125	4822 122 33177	10nF 20% 50V
2127	5322 122 31863	330pF 5% 50V
2128	5322 116 80853	560pF 5% 63V
2129	4822 124 40242	1µF 20% 63V
2131	4822 124 40248	10µF 20% 63V
2132	5322 122 32268	470pF 10% 50V
2133	5322 126 10794	220pF10% 50V
2135	4822 122 33128	15nF 10% 63V
2140	4822 125 60102	Trimcap 5p2-30pF 100V
2141	4822 125 60101	Trimcap 3-10pF 100V
2143	5322 122 32531	100pF 5%
2142	4822 125 60102	5p2-30pF 100V
2144	4822 121 42408	220nF 5% 63V
2145	4822 121 51263	510pF 1% 400V
2146	4822 121 70082	430pF 1% 400V
2147	5322 122 32654	22nF 10% 63V
2148	5322 122 32452	47pF 5% 63V
2149	4822 122 33177	10nF 20% 50V
2150	5322 122 32654	22nF 10% 63V
2151	4822 122 33219	1.8nF 10% 63V
2152	4822 124 40242	1µF 20% 63V
2153	5322 122 34099	470pF 10% 63V
2154	5322 122 32481	15pF 5% 50V
2155	5322 122 32965	18pF 5% 50V
2156	4822 124 40433	47µF 20% 25V

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2158	5322 126 10223	4.7nF 10% 63V
2159	5322 126 10223	4.7nF 10% 63V
2160	4822 124 41631	1.5µF 50V
2161	4822 122 32927	220nF +80-20% 50V
2162	4822 126 11585	22nF +80-20% 25V
2188	5322 122 32654	22nF 10% 63V
2196	5322 122 32448	10pF 5% 50V
2210	4822 124 41643	100µF 16V 20%
2215	5322 122 32268	470pF 10% 50V
2221	5322 122 32268	470pF 10% 50V
2224	4822 122 33575	220pF 5% 50V
2225	4822 122 33575	220pF 5% 50V

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3101	4822 052 10478 △	4Ω7 5% 0.33W
3102	4822 051 20224	220k 5% 0.1W
3104	4822 051 20154	150k 5% 0.1W
3105	4822 051 20562	5k6 5% 0.1W
3106	4822 051 20829	82Ω 5% 0.1W
3107	4822 051 20008	0Ω 0 jump
3113	4822 053 10221	220Ω 5%
3114	4822 051 20332	3k3 5% 0.1W
3115	4822 051 20391	390Ω 5% 0.1W
3116	4822 051 20478	4Ω7 5% 0.1W
3117	4822 051 20331	330Ω 5% 0.1W
3118	4822 050 22201	220Ω 1% 0.6W
3120	4822 052 10229 △	22Ω 5% 0.33W
3121	4822 051 20272	2k7 5% 0.1W
3122	4822 051 20562	5k6 5% 0.1W
3123	4822 051 20223	22k 5% 0.1W
3124	4822 117 10833	10k 1% 0.1W
3125	4822 100 11213	22k 30%lin 0.1W
3126	4822 051 20123	12k 5% 0.1W
3127	4822 051 20182	1k8 5% 0.1W
3128	4822 051 20182	1k8 5% 0.1W
3129	4822 117 10833	10k 5%
3130	4822 116 52283	4k7 5% 0.5W
3131	4822 100 11319	4k7 30%lin 0.1W
3132	4822 117 10833	10k 1% 0.1W
3134	4822 116 52289	5k6 5% 0.5W
3135	4822 051 10008	0Ω 5% 0.25W
3137	4822 116 52283	4k7 5% 0.5W
3138	4822 116 83922	150Ω 5% 1W
3139	4822 051 20008	0Ω 0 jump
3140	4822 051 20821	820Ω 5%
3141	4822 051 20182	1k8 5%
3142	4822 051 20472	4k7 5% 0.1W
3143	4822 051 20821	820Ω 5% 0.1W
3144	4822 051 20331	330Ω 5% 0.1W
3145	4822 051 20271	270Ω 5% 0.1W
3147	4822 116 52289	5k6 5% 0.5W

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3148	4822 051 20104	100k 5% 0.1W
3149	4822 051 20472	4k7 5% 0.1W
3150	4822 050 25601	560Ω 1% 0.6W
3151	4822 116 52283	4k7 5% 0.5W
3152	4822 117 10833	10k 1% 0.1W
3155	4822 050 22201	220Ω 1% 0.6W
3156	4822 051 20153	15k 5% 0.1W
3157	4822 051 20472	4k7 5% 0.1W
3158	4822 116 52283	4k7 5% 0.5W
3159	4822 051 20104	100k 5% 0.1W
3160	4822 051 20104	100k 5% 0.1W
3162	4822 050 22701	270Ω 1% 0.6W
3163	4822 117 10833	10k 1% 0.1W
3164	4822 051 20473	47k 5% 0.1W
3165	4822 050 11002	1k 1% 0.4W
3166	4822 050 11002	1k 1% 0.4W
3167	4822 050 11002	1k 1% 0.4W
3168	4822 051 20008	0Ω 0 jump
3170	4822 117 10833	10k 1% 0.1W
3171	4822 051 20223	22k 5% 0.1W
3172	4822 051 20472	4k7 5% 0.1W
3173	4822 051 20223	22k 5% 0.1W
3190	4822 051 20479	47Ω 5% 0.1W
3194	4822 051 20472	4k7 5% 0.1W
3196	4822 051 20008	0Ω 0 jump
3197	4822 051 20008	0Ω 0 jump
3198	4822 117 10833	10k 1% 0.1W
3199	4822 051 20471	470Ω 5% 0.1W
3202	4822 051 20008	0Ω 0 jump
3223	4822 051 20474	470k 5% 0.1W
3225	4822 050 11002	1k 1% 0.4W
3229	4822 051 20008	0Ω 0 jump
3233	4822 051 10102	1k 2% 0.25W
3238	4822 051 20008	0Ω 0 jump
3239	4822 051 20274	270k 5% 0.1W
3240	4822 051 20182	1k8 5%
3241	4822 051 20008	0Ω 0 jump

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5103	4822 242 81249	Ceramic filter 10.7MHz
5104	4822 157 63029	AM Coil
5105	4822 157 63904	FM Detector Coil
5106	4822 157 71661	Anti Birdy filter
5107	4822 157 71094	MW Aerial Coil
5108	4822 157 63912	AM oscillator
5109	4822 157 71093	LW Aerial Coil
5110	4822 242 71878	Ceramic filter 450kHz
5111	4822 242 81248	Ceramic filter 456kHz
5112	4822 242 72976	Crystal 7.2MHz
5113	4822 242 81249	Ceramic filter 10.7MHz
5114	4822 157 51503	Inductor 560µH

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6101	4822 130 34174	BZX79-C4V7
6102	4822 130 83075	Varicap diode HN1V02H
6110	4822 130 30621	1N4148

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7103	4822 209 31001	LA1851N
7104	5322 130 60068	BC558C
7105	4822 209 30178	LC7218
7106	4822 130 41327	BC327-40
7107	5322 130 41982	BC848B
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7110	5322 130 44779	BC338-40
7111	5322 130 41982	BC848B
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	5322 130 44779	BC338-40
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7125	4822 130 44197	BC558B

Note : Only the parts mentioned in this list are normal service spare parts.

CD BOARD

MISCELLANEOUS

1840	4822 691 20931	RCD 1.2D drive assy
1920	4822 276 13495	Tact Switch 0.3A/50V

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2802	4822 122 33069	33pF 5% 50V
2804	4822 126 13098	5.6nF 20% 16V
2805	4822 126 10053	180pF 10%
2806	5322 121 42465	68nF 5% 63V
2807	4822 122 33197	1nF 10% 50V
2811	4822 124 41579	10µF 20% 50V
2812	4822 124 40246	4.7µF 20% 63V
2815	4822 124 41407	0.47µF 20% 63V
2817	4822 124 41407	0.47µF 20% 63V
2818	4822 124 41584	100µF 20% 10V
2821	4822 121 51256	39nF 10% 50V
2825	4822 124 41407	0.47µF 20% 63V
2826	4822 121 51256	39nF 10% 50V
2831	5322 121 42465	68nF 5% 63V
2832	4822 124 40242	1µF 20% 63V
2833	4822 126 11714	4.7nF 20%
2834	4822 126 11585	22nF +80-20% 25V
2836	4822 126 11714	4.7nF 20%
2837	4822 124 41407	0.47µF 20% 63V
2838	4822 122 10576	1.8nF 10%16V
2839	4822 126 12882	100nF +80-20% 50V
2840	4822 126 12882	100nF +80-20% 50V
2842	4822 124 41576	2.2µF 20% 50V
2843	4822 124 40201	1000µF 20%16V
2844	4822 126 12882	100nF +80-20% 50V
2846	4822 126 11585	22nF +80-20% 25V
2851	4822 122 10459	560pF 10% 50V
2852	4822 121 43396	120nF 5% 63V
2854	4822 126 12878	1.5nF 10%16V
2859	4822 121 42408	220nF 5% 63V
2864	4822 124 40242	1µF 20% 63V
2866	4822 122 10577	3.3nF 10%16V
2867	4822 126 13174	33nF +80-20% 16V
2874	4822 124 40242	1µF 20% 63V
2876	4822 122 10577	3.3nF 10%16V
2877	4822 126 13174	33nF +80-20% 16V
2883	4822 124 23768	220µF 20%10V
2886	4822 121 51252	470nF 5% 63V
2888	4822 124 41397	47µF 20% 25V
2889	4822 124 23768	220µF 20%10V
2890	4822 121 51252	470nF 5% 63V
2891	4822 124 23768	220µF 20%10V
2893	4822 126 12882	100nF +80-20% 50V
2894	4822 126 12882	100nF +80-20% 50V
2896	4822 126 11585	22nF +80-20% 25V

⊣⊢

2898	4822 124 80818	2200 uF 5.5V

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3801	4822 116 52303	8k2 5% 0.5W
3802	4822 116 52283	4k7 5% 0.5W
3803	4822 116 52303	8k2 5% 0.5W
3805	4822 100 20589	20k 30%lin 0.1W
3806	4822 100 20589	20k 30%lin 0.1W
3808	4822 116 81223	1M2 5% 0.5W
3811	4822 116 52284	47k 5% 0.5W
3814	4822 116 52252	180k 5% 0.5W
3815	4822 116 52276	3k9 5% 0.5W
3816	4822 116 52256	2k2 5% 0.5W
3817	4822 116 52197	56Ω 5% 0.5W
3818	4822 050 11002	1k 1% 0.4W
3821	4822 116 52175	100Ω 5% 0.5W
3822	4822 116 83864	10k 5% 0.5W
3823	4822 116 52234	100k 5% 0.5W
3824	4822 116 52296	6k8 5% 0.5W
3825	4822 116 52256	2k2 5% 0.5W
3828	4822 116 52249	1k8 5% 0.5W
3829	4822 116 81682	2M2 5% 0.5W
3830	4822 116 52238	12k 5% 0.5W
3831	4822 116 52304	82k 5% 0.5W
3832	4822 116 52244	15k 5% 0.5W
3833	4822 116 52257	22k 5% 0.5W
3834	4822 116 52234	100k 5% 0.5W
3836	4822 116 83864	10k 5% 0.5W
3837	4822 116 52269	3k3 5% 0.5W
3838	4822 100 20589	20k 30%lin 0.1W
3840	4822 116 52284	47k 5% 0.5W
3841	4822 116 83864	10k 5% 0.5W
3842	4822 116 52222	390Ω 5% 0.5W
3843	4822 116 83864	10k 5% 0.5W
3844	4822 116 52231	820Ω 5% 0.5W
3845	4822 116 83864	10k 5% 0.5W
3846	4822 116 52224	470Ω 5% 0.5W
3847	4822 116 52257	22k 5% 0.5W
3848	4822 116 52257	22k 5% 0.5W
3849	4822 116 52224	470Ω 5% 0.5W
3850	4822 116 52224	470Ω 5% 0.5W
3852	4822 116 52228	680Ω 5% 0.5W
3853	4822 116 52271	33k 5% 0.5W
3854	4822 116 52271	33k 5% 0.5W
3857	4822 116 52256	2k2 5% 0.5W
3865	4822 116 52284	47k 5% 0.5W
3866	4822 050 11002	1k 1% 0.4W
3867	4822 116 52224	470Ω 5% 0.5W
3869	4822 116 83864	10k 5% 0.5W
3875	4822 116 52284	47k 5% 0.5W

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3876	4822 050 11002	1k 1% 0.4W
3877	4822 116 52224	470Ω 5% 0.5W
3879	4822 116 83864	10k 5% 0.5W
3884	4822 116 52175	100Ω 5% 0.5W
3886	4822 052 10478 ⚠	4Ω7 5% 0.33W
3887	4822 050 11002	1k 1% 0.4W
3888	4822 116 83864	10k 5% 0.5W
3891	4822 116 52244	15k 5% 0.5W
3892	4822 116 52298	680k 5% 0.5W
3895	4822 116 83864	10k 5% 0.5W
3896	4822 050 11002	1k 1% 0.4W
3897	4822 050 11002	1k 1% 0.4W
3898	4822 050 11002	1k 1% 0.4W
3899	4822 050 11002	1k 1% 0.4W
3915	4822 116 52269	3k3 5% 0.5W
3931	4822 050 24708	4Ω7 1% 0.6W
3932	4822 116 52207	1k2 5% 0.5W
3933	4822 116 52249	1k8 5% 0.5W
3934	4822 116 52231	820Ω 5% 0.5W

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5851	4822 242 73557	Resonator 8.46MHz
5852	4822 152 20678	Inductor 33µH 10%

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7801	4822 209 72814	M51567P
7811	4822 209 72815	M51564P
7841	4822 209 32852	TDA7073A/N2
7842	4822 209 32852	TDA7073A/N2
7851	4822 209 62371	M5 427AFP
7852	4822 209 70422	MN4264-15
7861	4822 209 32421	TDA1311A/N2
7867	4822 130 44196	BC548C
7877	4822 130 44196	BC548C
7880	4822 130 44196	BC548C
7881	4822 130 41327	BC327-40
7882	4822 130 41327	BC327-40
7901	4822 209 90179	MC68HC05P4-417941
7931	4822 130 41327	BC327-40

Note : Only the parts mentioned is this list are normal service spare parts.

FRONT BOARD

MISCELLANEOUS

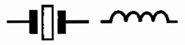
3	4822 466 62616	Sheet diffuser
4	4822 380 20503	LCD reflector
1281	4822 071 56301	△ Fuse 630mA 250V *
1285	4822 071 51252	△ Fuse 1.25A 250V
1286	4822 071 51252	△ Fuse 1.25A 250V
1288	4822 071 52002	△ Fuse 2A 250V
1289	4822 071 52002	△ Fuse 2A 250V
1307	4822 272 10366	△ Voltage selector *
1400	4822 130 91468	LCD LPH6304-1
1405	4822 267 51162	Connector
1406	4822 267 51162	Connector
1473	4822 276 13114	Tact Switch 20mA/15V
1474	4822 276 13114	Tact Switch 20mA/15V
1475	4822 276 13114	Tact Switch 20mA/15V
1476	4822 276 13114	Tact Switch 20mA/15V
1477	4822 276 13114	Tact Switch 20mA/15V
1478	4822 276 13114	Tact Switch 20mA/15V
1479	4822 276 13114	Tact Switch 20mA/15V
1480	4822 276 13114	Tact Switch 20mA/15V
1481	4822 276 13114	Tact Switch 20mA/15V
1482	4822 276 13114	Tact Switch 20mA/15V
1483	4822 276 13114	Tact Switch 20mA/15V
1484	4822 276 13114	Tact Switch 20mA/15V
1485	4822 276 13114	Tact Switch 20mA/15V
1486	4822 276 13114	Tact Switch 20mA/15V
1487	4822 276 13114	Tact Switch 20mA/15V
1488	4822 276 13114	Tact Switch 20mA/15V
1489	4822 276 13114	Tact Switch 20mA/15V

2241	5322 121 42386	100nF 5%63V
2242	5322 121 42386	100nF 5%63V
2243	5322 121 42386	100nF 5%63V
2256	5322 121 42386	100nF 5%63V
2257	5322 121 42386	100nF 5%63V
2263	4822 124 40242	1µF 20%63V
2265	4822 124 40433	47µF 20% 25V
2401	4822 124 40184	1000µF 20%10V
2402	4822 124 41579	10µF 20% 50V
2403	4822 126 12882	100nF +80-20% 50V
2404	4822 126 11585	22nF +80-20% 25V
2405	4822 122 33191	22pF 5% 50V
2406	4822 122 33191	22pF 5% 50V
2414	5322 121 42386	100nF 5%63V
2415	4822 124 80818	22M 5.5V
2417	4822 121 51387	10nF 20%16V
2420	4822 122 33191	22pF 5% 50V
2421	4822 122 33191	22pF 5% 50V
2431	4822 124 40433	47µF 20% 25V
2432	4822 122 33848	47pF 5%50V

2433	4822 122 33848	47pF 5%50V
2434	4822 122 33848	47pF 5%50V
2435	5322 121 42386	100nF 5%63V

3264	4822 116 52234	100k 5% 0.5W
3265	4822 116 83864	10k 5% 0.5W
3266	4822 050 11002	1k 1% 0.4W
3267	4822 116 52224	470Ω 5% 0.5W
3406	4822 116 52257	22k 5% 0.5W
3407	4822 116 52284	47k 5% 0.5W
3410	4822 050 11002	1k 1% 0.4W
3421	4822 050 11002	1k 1% 0.4W
3422	4822 050 11002	1k 1% 0.4W
3423	4822 050 11002	1k 1% 0.4W
3424	4822 050 11002	1k 1% 0.4W
3425	4822 050 11002	1k 1% 0.4W
3426	4822 050 11002	1k 1% 0.4W
3427	4822 050 11002	1k 1% 0.4W
3429	4822 050 11002	1k 1% 0.4W
3430	4822 050 11002	1k 1% 0.4W
3431	4822 050 11002	1k 1% 0.4W
3432	4822 050 11002	1k 1% 0.4W
3433	4822 050 11002	1k 1% 0.4W
3439	4822 050 11002	1k 1% 0.4W
3440	4822 050 11002	1k 1% 0.4W
3441	4822 116 52224	470Ω 5% 0.5W
3442	4822 116 52224	470Ω 5% 0.5W
3443	4822 050 11002	1k 1% 0.4W
3444	4822 116 52224	470Ω 5% 0.5W
3445	4822 116 52224	470Ω 5% 0.5W
3446	4822 050 11002	1k 1% 0.4W
3447	4822 050 11002	1k 1% 0.4W
3448	4822 050 11002	1k 1% 0.4W
3449	4822 050 11002	1k 1% 0.4W
3450	4822 050 11002	1k 1% 0.4W
3451	4822 050 11002	1k 1% 0.4W
3452	4822 116 83864	10k 5% 0.5W
3453	4822 116 83864	10k 5% 0.5W
3454	4822 116 52215	220Ω 5% 0.5W
3455	4822 116 90836	10Kx5(resnet)0.125W
3456	4822 116 52271	33k 5% 0.5W
3458	4822 050 11002	1k 1% 0.4W
3459	4822 050 11002	1k 1% 0.4W
3460	4822 050 11002	1k 1% 0.4W
3461	4822 050 11002	1k 1% 0.4W
3462	4822 050 11002	1k 1% 0.4W
3463	4822 050 11002	1k 1% 0.4W
3464	4822 116 90877	4k7 X8 5%
3465	4822 116 90835	10Kx7(resnet)0.125W

3466	4822 050 11002	1k 1% 0.4W
3470	4822 116 52176	10Ω 5% 0.5W
3471	4822 050 11002	1k 1% 0.4W
3472	4822 116 52256	2k2 5% 0.5W



5281	4822 157 71285	△ Choke Coil 400µH 30%
5401	5322 242 73697	Resonator 8MHz
5402	4822 242 70938	Crystal 32.768kHz
5403	4822 156 21721	Inductor 2.2µH 10%
5405	4822 156 21721	Inductor 2.2µH 10%
5407	4822 156 21721	Inductor 2.2µH 10%
5409	4822 156 21721	Inductor 2.2µH 10%
5410	4822 156 21721	Inductor 2.2µH 10%
5411	4822 156 21721	Inductor 2.2µH 10%
5412	4822 156 21721	Inductor 2.2µH 10%
5413	4822 156 21721	Inductor 2.2µH 10%
5414	4822 156 21721	Inductor 2.2µH 10%

6221	5322 130 30684	△ 1N4002GpF
6222	5322 130 30684	△ 1N4002GpF
6223	5322 130 30684	△ 1N4002GpF
6224	5322 130 30684	△ 1N4002GpF
6225	4822 130 30621	1N4148
6226	4822 130 30621	1N4148
6227	4822 130 30621	1N4148
6250	4822 130 82079	△ D3SBA20
6251	4822 130 30621	1N4148
6400	4822 130 30621	1N4148
6401	4822 130 82978	LTL-16KPE
6402	4822 130 30621	1N4148
6411	4822 214 52009	GP1U58XP

7256	4822 130 40937	BC548B
7401	4822 209 52484	TMP87CK20AF
7402	4822 209 31508	ST24C01CB1
7405	4822 130 40937	BC548B

Note : Only the parts mentioned is this list are normal service spare parts.
* For /21/21M/22

COMBI BOARD

MISCELLANEOUS

1221	4822 267 31176	Speaker Socket
1251	4822 267 40898	Headphone
1460	4822 276 13114	Tact Switch 20mA/15V
1461	4822 276 13114	Tact Switch 20mA/15V
1462	4822 276 13114	Tact Switch 20mA/15V
1463	4822 276 13114	Tact Switch 20mA/15V
1464	4822 276 13114	Tact Switch 20mA/15V
1465	4822 276 13114	Tact Switch 20mA/15V
1466	4822 276 13114	Tact Switch 20mA/15V

2201	4822 122 32535	680pF 10% 63V
2202	5322 122 32654	22nF 10% 63V
2203	4822 124 41525	100µF 20% 25V
2204	5322 122 34123	1nF 10% 50V
2205	4822 124 41579	10µF 20% 50V
2221	4822 124 40433	47µF 20% 25V
2223	5322 122 32654	22nF 10% 63V
2224	4822 124 42246	470µF 20% 25V
2225	4822 121 51387	10nF 20%16V
2227	4822 121 41854	150nF 5% 63V
2228	4822 124 40201	1000µF 20%16V
2232	4822 124 42246	470µF 20% 25V
2233	4822 124 40433	47µF 20% 25V
2234	4822 124 41525	100µF 20% 25V
2240	4822 126 12785	47nF TUB 50V
2244	4822 124 42119	4700µF 20% 25V
2251	4822 122 32535	680pF 10% 63V
2252	5322 122 32654	22nF 10% 63V
2253	4822 124 41525	100µF 20% 25V
2254	5322 122 34123	1nF 10% 50V
2255	4822 124 41579	10µF 20% 50V
2256	4822 124 40433	47µF 20% 25V
2257	5322 122 34123	1nF 10% 50V
2258	5322 122 32654	22nF 10% 63V
2259	4822 124 41997	470µF 10V
2260	4822 124 42119	4700µF 20% 25V
2261	4822 124 40433	47µF 20% 25V
2271	4822 124 40433	47µF 20% 25V
2277	4822 121 41854	150nF 5% 63V
2278	4822 124 40201	1000µF 20%16V
2290	4822 126 12785	47nF TUB 50V
2291	4822 126 12785	47nF TUB 50V
2292	4822 126 12785	47nF TUB 50V
2429	5322 122 32654	22nF 10% 63V
2430	5322 122 32654	22nF 10% 63V
2437	4822 124 41579	10µF 20% 50V
2438	4822 124 41997	470µF 10V

2501	5322 122 32531	100pF 5%50V
2502	5322 122 32531	100pF 5%50V
2503	5322 122 32531	100pF 5%50V
2504	5322 122 32531	100pF 5%50V
2505	5322 122 32531	100pF 5%50V
2506	5322 122 32531	100pF 5%50V
2510	5322 122 33861	120pF 10% 50V
2511	4822 124 41596	22μF 20%50V
2512	4822 124 41596	22μF 20%50V
2513	4822 124 40433	47μF 20% 25V
2514	4822 124 40433	47μF 20% 25V
2515	4822 124 40246	4.7μF 20% 63V
2516	4822 124 40246	4.7μF 20% 63V
2517	5322 122 34099	470pF 10% 63V
2518	5322 122 34099	470pF 10% 63V
2519	5322 122 33861	120pF 10% 50V
2520	5322 122 33861	120pF 10% 50V
2521	5322 122 32654	22nF 10% 63V
2522	5322 122 32654	22nF 10% 63V
2523	4822 124 41997	470μF 10V
2524	4822 124 41525	100μF 20% 25V
2525	5322 122 33861	120pF 10% 50V
2526	5322 122 32654	22nF 10% 63V
2527	4822 124 41596	22μF 20%50V
2528	4822 124 41596	22μF 20%50V
2529	4822 122 33336	8.2nF 10% 50V
2530	4822 122 33336	8.2nF 10% 50V
2531	4822 121 51356	180nF 10% 63V
2532	4822 121 51356	180nF 10% 63V
2533	4822 124 41579	10μF 20% 50V
2534	4822 124 41584	100μF 20% 10V
2535	4822 124 40433	47μF 20% 25V
2537	5322 122 32531	100pF 5%50V
2538	5322 122 32531	100pF 5%50V
2571	5322 122 32658	22pF 5% 50V
2601	4822 124 41579	10μF 20% 50V
2701	5322 122 34099	470pF 10% 63V
2702	5322 122 34099	470pF 10% 63V
2703	4822 124 40242	1μF 20% 63V
2704	4822 124 40242	1μF 20% 63V
2705	5322 122 31865	1.5nF 10% 63V
2706	5322 122 31865	1.5nF 10% 63V
2707	4822 124 41584	100μF 20% 10V
2708	4822 124 41584	100μF 20% 10V
2709	4822 126 11323	15nF 10% 25V
2710	4822 126 11323	15nF 10% 25V
2717	4822 126 11585	22nF +80-20% 25V
2718	4822 126 11585	22nF +80-20% 25V
2719	4822 126 11585	22nF +80-20% 25V
2720	4822 126 11585	22nF +80-20% 25V
2721	4822 124 40433	47μF 20% 25V
2722	4822 124 40433	47μF 20% 25V

2723	5322 122 34123	1nF 10% 50V
2724	5322 122 34123	1nF 10% 50V
2725	5322 122 31865	1.5nF 10% 63V
2726	5322 122 31865	1.5nF 10% 63V
2753	4822 124 41579	10μF 20% 50V
2760	4822 124 40433	47μF 20% 25V
2761	4822 124 22263	220μF 20% 25V
2762	4822 124 40433	47μF 20% 25V
2763	4822 126 11585	22nF +80-20% 25V
2764	5322 122 32654	22nF 10% 63V
2770	4822 124 40242	1μF 20% 63V
2771	4822 126 11714	4.7nF 20%
2772	4822 122 10577	3.3nF 10%16V
2774	4822 126 11323	15nF 10% 25V
2775	4822 122 33169	680pF 10% 50V
2776	4822 122 33169	680pF 10% 50V

3221	4822 051 20101	100Ω 5% 0.1W
3223	4822 116 52215	220Ω 5% 0.5W
3227	4822 052 10478 ⚠	4Ω7 5% 0.33W
3240	4822 052 10228 ⚠	2Ω2 5% 0.33W
3252	4822 050 11002	1k 1% 0.4W
3254	4822 116 83864	10k 5% 0.5W
3255	4822 051 20472	4k7 5% 0.1W
3256	4822 051 20102	1k 5% 0.1W
3257	4822 051 20102	1k 5% 0.1W
3258	4822 051 20102	1k 5% 0.1W
3259	4822 051 20102	1k 5% 0.1W
3260	4822 051 20103	10k 5% 0.1W
3261	4822 117 11139	1k5 1% 0.1W
3262	4822 051 20121	120Ω 5% 0.1W
3263	4822 051 20272	2k7 5% 0.1W
3264	4822 051 20103	10k 5% 0.1W
3265	4822 051 20333	33k 5% 0.1W
3266	4822 051 20563	56k 5% 0.1W
3267	4822 052 10108 ⚠	1Ω 5% 0.33W
3269	4822 116 52228	680Ω 5% 0.5W
3271	4822 051 20101	100Ω 5% 0.1W
3273	4822 051 20682	6k8 5% 0.1W
3275	4822 116 52215	220Ω 5% 0.5W
3277	4822 052 10478 ⚠	4Ω7 5% 0.33W
3290	4822 052 10228 ⚠	2Ω2 5% 0.33W
3315	4822 051 20153	15k 5% 0.1W
3316	4822 051 20153	15k 5% 0.1W
3501	4822 051 20123	12k 5% 0.1W
3502	4822 051 20123	12k 5% 0.1W
3503	4822 051 20223	22k 5% 0.1W
3504	4822 051 20223	22k 5% 0.1W
3505	4822 116 52257	22k 5% 0.5W

3506	4822 051 20223	22k 5% 0.1W
3507	4822 051 20222	2k2 5% 0.1W
3508	4822 051 20222	2k2 5% 0.1W
3509	4822 051 20153	15k 5% 0.1W
3510	4822 116 52244	15k 5% 0.5W
3511	4822 051 20103	10k 5% 0.1W
3512	4822 051 20103	10k 5% 0.1W
3513	4822 051 20102	1k 5% 0.1W
3514	4822 051 20102	1k 5% 0.1W
3515	4822 050 11002	1k 1% 0.4W
3516	4822 050 11002	1k 1% 0.4W
3517	4822 051 20393	39k 5% 0.1W
3518	4822 051 20393	39k 5% 0.1W
3519	4822 051 20103	10k 5% 0.1W
3520	4822 051 20103	10k 5% 0.1W
3521	4822 051 20563	56k 5% 0.1W
3523	4822 116 52224	470Ω 5% 0.5W
3524	4822 051 20473	47k 5% 0.1W
3525	4822 116 52289	5k6 5% 0.5W
3526	4822 116 52289	5k6 5% 0.5W
3527	4822 116 52243	1k5 5% 0.5W
3528	4822 116 52243	1k5 5% 0.5W
3529	4822 116 52228	680Ω 5% 0.5W
3530	4822 116 52228	680Ω 5% 0.5W
3531	4822 051 20472	4k7 5% 0.1W
3532	4822 051 20472	4k7 5% 0.1W
3533	4822 050 11002	1k 1% 0.4W
3534	4822 050 11002	1k 1% 0.4W
3535	4822 051 10102	1k 2% 0.25W
3566	4822 116 52283	4k7 5% 0.5W
3567	4822 116 52224	470Ω 5% 0.5W
3568	4822 116 52224	470Ω 5% 0.5W
3569	4822 116 52235	1M 5% 0.5W
3570	4822 116 52235	1M 5% 0.5W
3571	4822 116 52234	100k 5% 0.5W
3573	4822 116 52256	2k2 5% 0.5W
3574	4822 116 52256	2k2 5% 0.5W
3601	4822 116 52215	220Ω 5% 0.5W
3602	4822 116 83864	10k 5% 0.5W
3603	4822 116 83864	10k 5% 0.5W
3604	4822 116 52207	1k2 5% 0.5W
3605	4822 051 20103	10k 5% 0.1W
3607	4822 051 20332	3k3 5% 0.1W
3608	4822 052 10228 ⚠	2Ω2 5% 0.33W
3630	4822 116 52219	330Ω 5% 0.5W
3631	4822 116 83864	10k 5% 0.5W
3701	4822 051 20471	470Ω 5% 0.1W
3702	4822 051 20471	470Ω 5% 0.1W
3703	4822 116 52224	470Ω 5% 0.5W
3704	4822 116 52224	470Ω 5% 0.5W
3705	4822 116 52239	120k 5% 0.5W
3706	4822 116 52239	120k 5% 0.5W

3707	4822 116 52186	22Ω 5% 0.5W
3708	4822 116 52186	22Ω 5% 0.5W
3709	4822 116 52303	8k2 5% 0.5W
3710	4822 116 52303	8k2 5% 0.5W
3713	4822 051 20123	12k 5% 0.1W
3714	4822 051 20123	12k 5% 0.1W
3719	4822 051 20332	3k3 5% 0.1W
3720	4822 116 52269	3k3 5% 0.5W
3721	4822 116 52269	3k3 5% 0.5W
3722	4822 116 52269	3k3 5% 0.5W
3723	4822 116 52224	470Ω 5% 0.5W
3724	4822 116 52224	470Ω 5% 0.5W
3725	4822 051 20123	12k 5% 0.1W
3726	4822 051 20123	12k 5% 0.1W
3727	4822 116 52304	82k 5% 0.5W
3728	4822 116 52304	82k 5% 0.5W
3729	4822 116 52226	560Ω 5% 0.5W
3730	4822 116 52226	560Ω 5% 0.5W
3751	4822 116 52269	3k3 5% 0.5W
3752	4822 116 52269	3k3 5% 0.5W
3754	4822 116 83864	10k 5% 0.5W
3756	4822 116 83864	10k 5% 0.5W
3757	4822 116 83864	10k 5% 0.5W
3758	4822 116 83864	10k 5% 0.5W
3759	4822 051 20103	10k 5% 0.1W
3760	4822 111 30893	4M7 5% 0.2W
3761	4822 116 52175	100Ω 5% 0.5W
3762	4822 116 52245	150k 5% 0.5W
3770	4822 116 52206	120Ω 5% 0.5W
3771	4822 116 52297	68k 5% 0.5W
3772	4822 116 52188	27Ω 5% 0.5W
3773	4822 050 11002	1k 1% 0.4W
3774	4822 116 52191	33Ω 5% 0.5W
3775	4822 051 20391	390Ω 5% 0.5W
3801	4822 051 20182	1k8 5% 0.1W
3802	4822 051 20182	1k8 5% 0.1W
3803	4822 051 20472	4k7 5% 0.1W
3804	4822 051 20472	4k7 5% 0.1W
3805	4822 051 20471	470Ω 5% 0.1W
3806	4822 051 20471	470Ω 5% 0.1W
3807	4822 051 20103	10k 5% 0.1W
3810	4822 050 11002	1k 1% 0.4W

5501	4822 134 41198	Lamp blue 115mA 5V
5502	4822 134 41198	Lamp blue 115mA 5V
5503	4822 134 41198	Lamp blue 115mA 5V
5770	4822 156 20946	Osc Coil 100kHz

6226	4822 130 30621	1N4148 (UAW)
6252	4822 130 30621	1N4148 (UAW)
6253	5322 130 31504	BZX79-C3V3
6254	4822 130 30621	1N4148 (UAW)
6255	4822 130 34197	BZX79-C12V
6261	4822 130 34233	BZX79-C5V1
6341	5322 130 31504	BZX79-C3V3
6342	5322 130 30684	1N4002GpF (UAW)
6502	4822 130 30621	1N4148 (UAW)
6503	4822 130 34233	BZX79-C5V1 (UAW)
6505	4822 130 30621	1N4148 (UAW)
6701	4822 130 34382	BZX79-C8V2

7252	4822 130 60089 ⚠	BD436
7254	4822 130 40823 ⚠	BD135(UAW)
7255	4822 130 44196	BC548C
7270	4822 130 44196	BC548C
7271	4822 130 44196	BC548C
7272	5322 130 60068	BC558C(UAW)
7313	4822 209 72368	AN7147
7403	4822 130 63727	IMT5
7404	4822 130 63727	IMT5
7405	4822 130 44196	BC548C
7501	4822 209 10263	4052B (UAW)
7505	4822 209 83274	NJM4560D
7513	4822 130 40981	BC337-25 (UAW)
7514	4822 130 40981	BC337-25 (UAW)
7519	4822 130 40937	BC548B
7520	4822 130 40937	BC548B
7521	4822 130 41327	BC327-40
7522	4822 130 41327	BC327-40
7523	4822 130 44196	BC548C
7701	4822 209 32918	AN7318S
7751	4822 130 44196	BC548C
7752	4822 130 44196	BC548C
7753	4822 130 44197	BC558B
7770	4822 130 41344	BC337-40 (UAW)

Note : Only the parts mentioned is this list are normal service spare parts.

MISCELLANEOUS PARTLIST

	4822 445 10435	Pair-to-left speaker
	4822 445 10436	Pair-to-right speaker
	4822 303 50063	FM aerial
	4822 303 50082	AM frame aerial
	4822 218 10574	Remote Control
385	4822 321 10853 ⚠	Main cord
385	4822 321 10941 ⚠	Main cord/25
387	4822 736 22386	IFU (GB-S-F-C)/21/21M
387	4822 736 22441	IFU (Multi-languages)
5300	4822 146 21802 ⚠	Transformer

Note : Only the parts mentioned is this list are normal service spare parts.

GB WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

ESD

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

NL WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

CLASS 1
LASER PRODUCT
3122 110 03420

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF Varoitus !

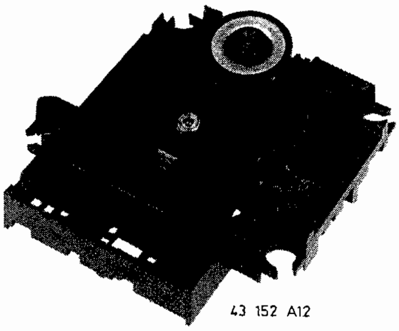
Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

Compact Disc Drive RCD 1.2D

Service
Service
Service



Service Manual

COMPACT
disc
DIGITAL AUDIO

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Exchange instruction for optical pickup unit
Partslist
Service hints
Cleaning the lens

CLASS 1
LASER PRODUCT

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

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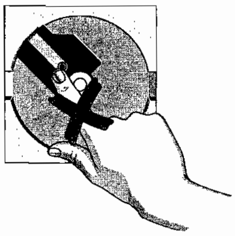
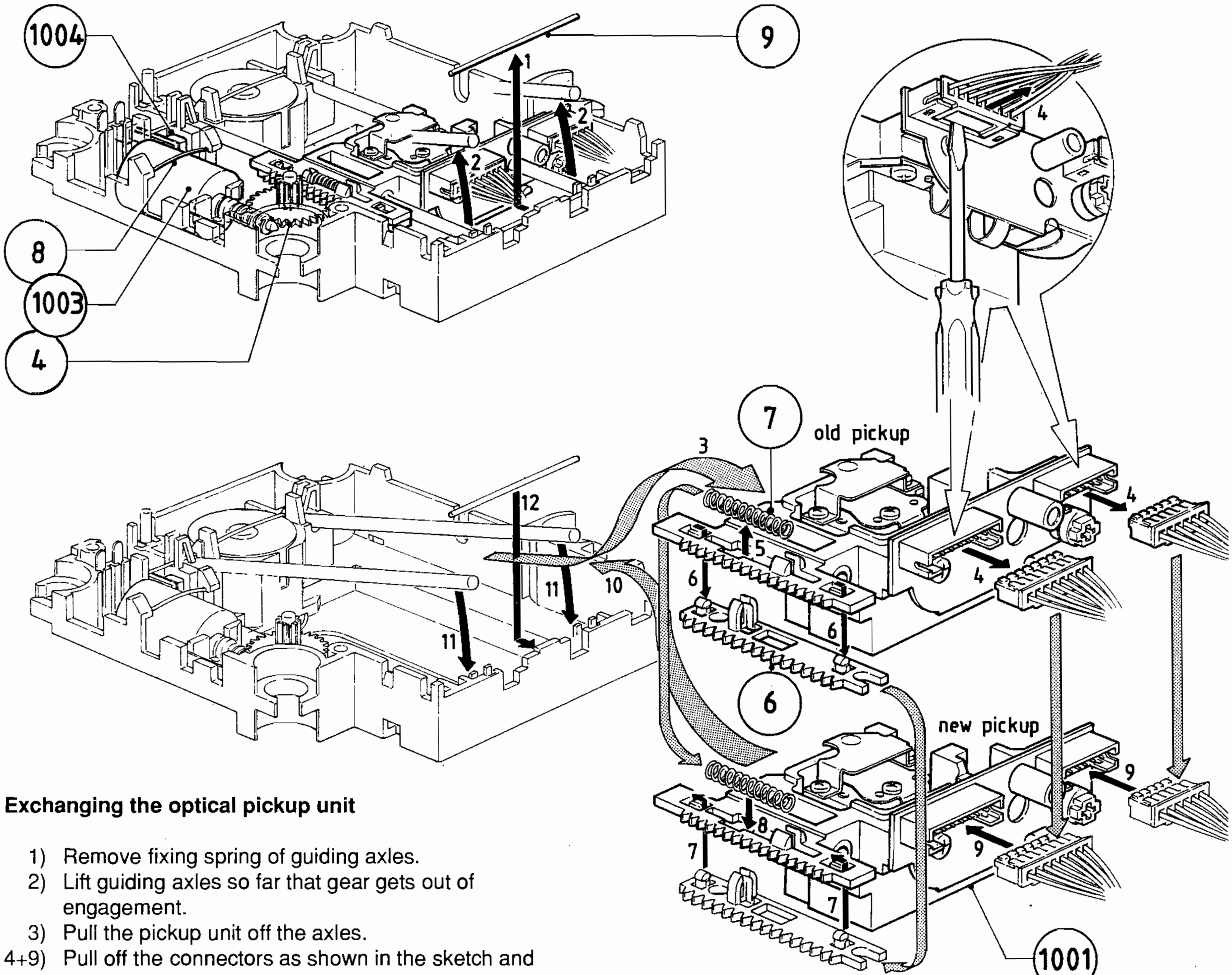
CS 48 656

Exchange instruction for the OPTICAL PICKUP unit

WARNINGS: Danger of electrostatic discharge!
The laser diode is more sensitive to ESD than MOS ICs.
Therefore take care of ESD-protection whenever working on the disc drive.

Never touch the lens!





Exchanging the optical pickup unit

1) Remove fixing spring of guiding axles.
2) Lift guiding axles so far that gear gets out of engagement.
3) Pull the pickup unit off the axles.
4+9) Pull off the connectors as shown in the sketch and plug them on the new pickup unit.
5+6) Remove the toothed bar plus compression spring.
7+8) Mount toothed bar and compression spring on new pickup unit.
10) Put the new pickup unit on the guiding axles.
11) Put guiding axles down to the chassis while positioning the pickup unit so that gear is forced easily into engagement.
12) Mount fixing spring of guiding axles.

IMPORTANT NOTE:
All electrical adjustments have to be carried out new. Follow the adjustment table of the service manual for the relevant set the disc drive is used.
The laser control is located on the optical pickup unit. The laser current has therefore already been adjusted by the factory.

	4822 691 20768	RCD1.2D disc drive assy
4	4822 522 32451	gear wheel
6	4822 522 32453	toothed bar
7	4822 492 51979	spring, compression
8	4822 492 63941	spring, wire (motor)
9	4822 492 63942	spring, wire (axles)
1001	4822 691 30327	optical pickup unit
1003	4822 361 21113	servomotor, RF300C-11440
1004	4822 276 12163	switch, leaf

Only those parts of which a service code number is stated are service parts.

SERVICE HINTS

Service DISC - HOLDDOWN

The disc must always be fixed well on the turntable.
If the mechanism has to be dismounted for repair, a separate disc-holddown has to be used (e.g. service disc-holddown 4822 532 51871).
The CD mechanism then can function normally as in the set.

CHARACTERISTIC FAILURES

Possible customer complaint:
- *no function, does not startup*
- *plays badly*
- *skips tracks*
- *very sensitive to shocks*

General observation by investigation:

HF- signal too small.

Cause: Mechanical x/y-adjustment of the diode array on the optical pickup unit has drifted.

Attention: The laser control of the RCD1.2 disc drive is located on the optical pickup unit. The laser current has been adjusted in the production line and is **not** intended to be **varied for service purposes.**

If the HF - signal is considerably smaller than 800mV$_{pp}$, check as follows:

∗ Play a disc.

∗ Turn the FOCUS OFFSET potmeter while observing the HF - signal:

– THE HF - SIGNAL DECREASES IN BOTH DIRECTIONS
→ the x/y-adjustment of the diode array is o.k.

– THE HF - SIGNAL INCREASES IN ONE DIRECTION
→ adjust to max. HF signal level and check

FOCUS OFFSET voltage:

≤ ±100mV DC → x/y-adjustment of diode array within tolerance.

> ±100mV DC → x/y-adjustment of diode array has drifted and is out of tolerance.
→ **exchange optical pickup unit!**

In case of a positive result – x/y-adjustment of diode array is o.k. – the reason for a too small HF signal might be a dying laser diode or any other fault in the electronic circuit.

REDUCTION of REPAIR PRICE

If the disc drive does not function, in most cases the optical pickup unit will be defect.
To reduce the actual repair price it is recommended to replace the optical pickup unit only.
Follow the exchange instruction on the previous page.

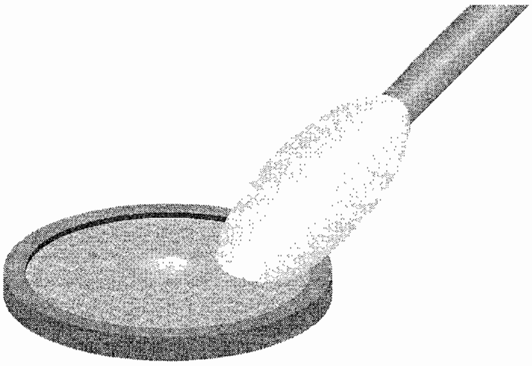
CLEANING the LENSE

Principle: Avoid cleaning of the lens !

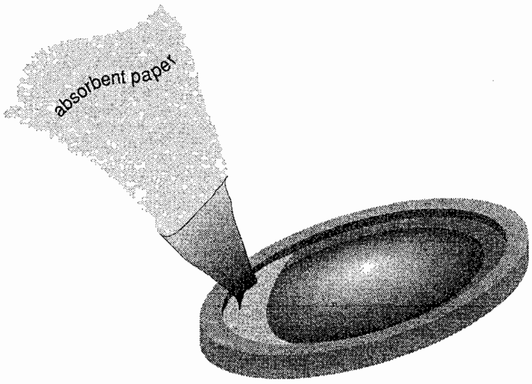
DUST particles are normally no major problem. They can be blown away with oilfree compressed air.

Finger - prints

If the lens is obviously polluted with finger - prints, it can be cleaned with alcohol or spirit.
Take a padstick and tip it into alcohol until it is soaked.
Then clean the surface of the lens by rotating the soaked padstick smoothly.
The alcohol will dissolve the finger - prints, rotation helps mechanically. Finally the lens will be filled with the dirty cleaning solvent.



Now incline the lens (disc drive) and soak the solvent up with absorbent paper.
The remnants of the solvent will evaporate.



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PHILIPS

4942

Art.-Code: 53
Sachgebiet: Mini Anlage
Memo: de10stk

SI

Wichtig für die Werkstatt!
Nummer: 53036
Datum: 26.11.96

Service Information

Betrifft: FW12

Verteiler: Sc,F1

Bei einigen Geräten kann es vorkommen, daß mechanische Fokussuchgeräusche zu hören sind . Um diese zu verringern kann ein Kondensator mit 2,2nF über den Widerstand 3830 12kΩ geschaltet werden.
Der Widerstand 3830 befindet sich im Service Manual auf Seite 7-3.

Form 80 048

Nachdruck nicht gestattet! Änderungen vorbehalten.